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COMMENTS ON THE TREATMENT OF HEART DISEASE *

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CHICAGO

In this paper there might properly be considered the preventive treatment of heart disease. This would include the proper management of acute and chronic general and focal infections whose relation to acute carditis and so-called chronic fibrous myocarditis is rationally assumed, rather than proved, to be rather close. There would be stressed the prevention and early treatment of syphilis, a prolific cause of aortic and cardiac disease. Above all there would be emphasized the importance of doing what can be done to guard against rheumatism. Cooperation in the international study of rheumatism would be urged as a privilege and a duty for American medicine. There would also be mention of the regulation of modes of living in the attempt to prevent or postpone the early breakdown of the heart of valvular or myocardial disease or of hypertension. So, too, there would be noted a group with potential heart disease, those who are inclined toward or "threatened" with heart disease and for whom advice as to right living may mean much. In this class might be put the obese, the gouty, the emphysematous, the kyphoscoliotic, the plethoric, the anemic, flabby, undernourished individual, psychoneurotic patients of certain types and those with the stigma of hereditary early cardiovascular degeneration. And one would applaud the efforts now being put forth and under contemplation to learn more of the essential nature and rational means of handling the degenerative processes of adult and senescent years, concerning which there is so much speculation and so little accurate knowledge.

I shall, however, omit consideration of these matters of prophylaxis. Nor will I dwell on the latest advances in cardiac therapy—surgical, dietetic, medicinal. Some of the writings concerning them are understandable; others seem merely a maze of words. Some of these newer therapeutic measures strike one as promising, others as far-fetched. All of them may better be considered in the quiet of the study or, if attractive, tried out in the laboratory or the hospital ward.

Therefore, departing a little from the custom, I shall call attention to certain undesirable or even harmful tendencies that are concerned rather with the art than with the science of medicine. Though not new, they seem worthy of rediscussion at this time when the attention of physician and layman is so strongly focused on disease of the heart.

The cynic said to me, when he heard that I was to discuss the treatment of heart disease: "Why not condense and say there is no treatment for heart disease save rest and digitalis?" On being hard pressed, he admitted that at times opium or a cathartic might be helpful. Really, the cynic is not far wrong. The great majority of our heart cases are treated along these lines. Rest to permit recovery of muscular tone and to prevent overstrain of a damaged organ. Digitalis to slow conductivity and heart rate and thus secure more rest, together with more vigorous ventricular contractions and more normal output of blood with each beat. Opium to relieve pain, induce sleep and lessen nerve strain. A laxative for purposes of elimination. This is good treatment and need not be discussed. But there are occasional misapplications of the general principles to which reference may properly be made.

Consider the subject of rest. How much during or after an acute carditis? How much following a cardiac breakdown or after a coronary occlusion? How much in the case of a fibrillating auricle with mitral stenosis or in the failing heart of hypertension, the patient in either case perhaps able to be up and about?

These are not easy questions to answer. Fixed rules cannot and should not be laid down. There seems to be a wide difference in the practice of different physicians. Some prescribe too little rest for acute inflammation of the heart and for serious breakdown of a chronically diseased heart and, on the other hand, too much rest for milder grades of cardiac insufficiency and especially for cardiac disease with no evidence of present or impending breakdown.

In general, an acute carditis demands rest until the temperature and pulse are normal and until moderate exercise does not cause the temperature to rise, the pulse to show undue irritability, or dyspnea to make its appearance.

The patient with failing heart, whether from primary chronic valvular or myocardial lesion, needs rest long after his more urgent symptoms have disappeared. A too early resumption of work will promptly cause another breakdown—the old story familiar to every hospital physician. So rest is proper, rest is preached to our students and practitioners; and our heart societies plead for convalescent homes for these two types of patients, the one recovering from an acute carditis and the other from an acute breakdown in the course of a chronic disease.

No wonder then that many physicians feel that prolonged rest is essential in all cases of heart disease. They get the habit of prescribing it even though the heart is frankly competent, merely because some slight

* Read before the Congress of Physicians and Surgeons, Washington, D. C., May 2, 1928.

deviation from the normal has been found. They constantly emphasize the avoidance of exertion.

Many physicians need to have removed the bugbear fear of exertion. It is not a new thought that the heart muscle after the subsidence of the acuter symptoms may, like skeletal muscles, need exercise; that what is needed in many instances is not less, but more exercise. Patients must be told that a rheumatic heart or a leaky valve does not necessarily imply a life of inactivity and idleness. Individualization is the key to this feature of treatment. We may not all agree with Dr. St. Lawrence, who says that with children, after an acute rheumatic endocarditis, daily exercise to the point of tolerance is to be advised; but we must agree with his advocacy of placing a time limit to rest and substituting therefor a system of training of the heart muscle so that it may recover its tone and reach and maintain its maximum of efficiency.

And what about digitalis? I know I am treading on dangerous ground when I venture to say that there is a too strong tendency to impose on the profession arbitrary rules as to the use of this drug, rules that are in part contradicted by the every day results of bedside practice. The fact that so many physicians successfully prescribe digitalis without thought of cat units, accurate body weight, or rate of elimination; that they use it in conditions other than auricular fibrillation; that they do not refrain in an urgent situation from giving it subcutaneously, intramuscularly or intravenously; that they very rarely feel compelled to give the massive dose in order to get the prompt effect, all this is a protest—an unconscious one, to be sure—against the too dogmatic directions that have been given publicity, directions that are perhaps too much based on laboratory experiment, with too little control by extensive bedside observation. The clinician often knows that he can get good results by the intramuscular or intravenous route when by the stomach he is disappointed. He finds at times that if he spares the stomach there may not be as much nausea, though he does not dispute the statement that the nausea and vomiting of digitalis are primarily cardiac, and reflexly central, in origin. Instead of the massive dose, he may prefer for emergency effect the guarded intravenous use of strophanthin or ouabain. He thinks—sometimes he says he knows—that he gets results by giving digitalis in conditions other than fibrillation—in hypertension with beginning failure, and even though blood pressure may be still high; in the failing heart of pneumonia and other infections; in valvular and myocardial lesions before fibrillation has set in. He may not be able to tell you why. He may not have a fixed dose. He gives till he gets results, which is the rule, we are told, that Cushney used to teach his students. In a similar manner he gives his morphine. He may try one-eighth or a sixth or a grain; or, if the pain is severe as in renal colic, he may give one-third or even one-half grain. He is after results.

If timid, he may be fearful as to the toxic effects of digitalis. He knows, as Mr. Dooley said: "Drugs are a little iv a pizen that a little more would kill ye." So much has been said about cumulative and toxic effects—and with reason, for the danger from overdosing is a real one—that many physicians are deterred from using an efficient amount. Much too small and ineffectual doses are not infrequently seen. The good repute of digitalis is reestablished when there is an increase in the amount and favorable results follow.

The greatest fault, however, is the giving of digitalis without any indication for its use except the diagnosis of heart disease—and this diagnosis sometimes wrong.

It may be straying a little from the subject of treatment to refer to the fact that in many of these cases there has been a mistake in diagnosis that has led to the unnecessary use of digitalis. No heart lesion whatever, or an unimportant variation from the normal, has been regarded as pathologic and as demanding treatment. A respiratory arrhythmia, an increased rate, a faint systolic murmur or a suspicion of one, a cardiac impulse a little too far to the left, a blood pressure a few points too high, a precordial uneasiness, these and other symptoms have led to the unwarranted diagnosis of heart disease, activity has been restricted, digitalis prescribed and our supposed cardiopath is on the way to become a confirmed neuropath. How does it happen? Ignorance, haste, carelessness, indifference, too great reliance on x-ray or electrocardiograph will explain many cases. But I believe that the greater number are to be explained by the fact that the physician has a surplus of honesty and is earnestly desirous of making an early diagnosis of heart disease. He has heard from teachers, he has read in the medical journal that the early diagnosis of heart disease, as of tuberculosis or cancer, is the great desideratum. In this way and in this way only can the serious cardiac breakdown be postponed.

But he has not read of the errors in the diagnosis of heart disease and of tuberculosis. He should read what Edouard Rist has to say on this subject of errors in the diagnosis of pulmonary tuberculosis. Rist's figures, based largely on hurried wartime examinations, certainly must overstate the frequency of the error of more deliberate examinations in time of peace. They are startling yet illuminating. One third of a large number of cases in France treated for tuberculosis were not tuberculosis at all. Rist quoted similar statistics for England. Friedrich von Mueller said that a like error had been made in Germany. Heart disease and tuberculosis are not the same, yet the mistake of diagnosing wrongly may in either instance lead to direful consequences, unnecessary fear, lives of inactivity, enormous economic loss.

In this connection, a few words that have to do more with the treatment of the patient than of the disease:

There is ingrained in the minds of most people a greater fear of heart disease than of any other malady unless it be cancer or syphilis. To most laymen, sudden or dropsical death is implied by the term heart disease. How important, therefore, that there be not aroused without reason the thought of this condition. Yet how often the practitioner or the specialist, as he examines the chest or gets the history, arouses the dread of something wrong with the heart, when perhaps there is nothing the matter. He may do it by a shrug of the shoulders, an air of hesitation or of perplexity as though not quite understanding what he hears, by a comment on a faint murmur or a skipped beat. He usually does this innocently, forgetting that it is not always wise to think out loud, especially when there is an element of doubt or uncertainty and when there is present an interested yet apprehensive, impressionable listener.

Again, when there is some real cardiac disturbance the greatest care is necessary not to convey a wrong impression. Emerson has said: "It is not the fact that imports but the effect of the impression of the fact on the mind." To tell a patient that he has a leaky valve or a large heart, i. e., that he has heart disease, may be to state a fact. Unless this statement is explained to suit the intelligence of the patient and to accord with

the degree of severity of the heart lesion, a wrong impression may be left, the impression of a disease that is destined to advance relentlessly toward an early death. The statement, truthful as to fact, may be untruthful in its effects, i. e., its impression on the mind of the hearer. An unintentional lie has been uttered, as much an untruth as though the physician finding a definite organic disease flatly denies its existence.

There is a danger not fully recognized that the movement for periodic health examinations will, unless most carefully watched, make people too introspective, too apprehensive. Unless the examinations are made by competent men, who understand human nature as well as disease and how to recognize it, greater harm than good may come. This will be not so much because physicians are ignorant or careless as because they will feel the necessity of calling attention to slight departures from the normal that may really be of no moment, a procedure that may cause worry, anxiety or genuine nervous ill health in the susceptible individual. So, too, our heart associations must guard against fostering needless fear of heart disease by paying too much attention to slight cardiac disturbances and unduly stressing the importance of early recognition of heart disease. We cannot afford to develop a national cardiac neurosis.

The plea in this paper is for greater care as to how we examine, how we tell our patients, how we prescribe rest and digitalis; a plea for individualization. There is no intent to undervalue the laboratory study of drugs. But the time is not yet at hand when we can quantitatively estimate the degree of cardiac failure or, by reference to some slide rule, mechanically dose out rest or exercise or digitalis. The history, observation, physical examination, laboratory tests and instruments of precision must all be given a place in the treatment of heart disease. Even psychology has a definite function.

"Now," said the cynic, after reading this paper, "did I not say that the treatment was only rest and digitalis? That is practically what you have said."

"But," I replied, "I have emphasized the need of individualization, have suggested varying degrees of rest and the advantage of properly conducted examinations. To treat by a hard and fast rule of 'rest and digitalis' is unwise."

"Of course," pursued the objector, "I assumed that your practitioner or specialist was a man of experience and that he had common sense."

"Alas!" I replied, "some of us have knowledge but are not very wise; some of us see and know but do not think logically; some of us have had experience but have not learned; some of us are lacking in good judgment or what you call common sense. The trouble, you see, is that we are all human. So, old, plain truths have to be repeated or presented in forms to fit the passing moment."

And that is my apology for a very simple, old-fashioned paper.

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The Infantile Stomach.—The investigation of the infantile stomach by means of x-rays has opened up a hitherto undefined field, viz., that of the anatomy and physiology of the stomach during life. The form and position of the stomach is very similar to that of the adult, except that, as recent investigations seem to show, the position is usually horizontal rather than vertical. We can distinguish five parts: the fundus, body, pars angularis, canalis pylori (or pyloric antrum) and the pyloric valve.—Emdin, William: *Arch. Dis. Childhood*, October, 1928.

THE CLINICAL SIGNIFICANCE OF PRIMARY ACHLORHYDRIA*

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The ninety-three cases of achlorhydria studied between February, 1921, and February, 1928, can be broadly classified as primary and secondary. The causes that may operate to produce a secondary achlorhydria are chronic cholecystitis, gastric carcinoma, gastric syphilis, alcoholism, old age (arteriosclerosis), chronic upper respiratory infection (sinusitis, tonsillitis, bronchitis), mouth infection (caries and pyorrhea), pregnancy, toxic goiter, myxedema and tuberculosis (both pulmonary and intestinal). Achlorhydria is also found often enough in certain other conditions, such as migraine,

TABLE 1.—*Types of Achlorhydria*

	Cases	
Achlorhydria with sufficient intragastric cause *		
Visceroptosis and atony	1	
Gastric resection for carcinoma	2	
Benign gastric lesion	3	
	—	6 cases
Achlorhydria with probable extragastric causal factors		
Chronic myocarditis with passive congestion	1	
General arteriosclerosis	4	
Syphilis	2	
Appendicitis	2	
Migraine	4	
Tuberculous peritonitis	1	
Indeterminant bowel lesions	2	
Chronic sinusitis and bronchitis	10	
	—	16 cases
Achlorhydria in other disease entities presumably operative to cause achlorhydria †		
Arthritis (usually with upper respiratory foci)	6	
Periferal neuritis (with upper respiratory foci)	1	
Pyelonephritis (with upper respiratory foci)	1	
Goiter	3	
Pulmonary tuberculosis	2	
Addison's disease	1	
Pelvic disease	2	
Menopause (functional)	5	
Skin diseases:		
Urticaria	1	
Acne rosacea	1	
Ichythyosis corneae	1	
Melanosarcoma	1	
Scleroderma	1	
	—	20 cases
Primary achlorhydria in which no demonstrable cause or other disease entity was found		51 cases
Total		93 cases

*Not including carcinoma of the stomach and chronic cholecystitis.
† Not including functional and psychoneurotic conditions in which achylia was thought to be probably transient only.

allergic conditions and skin diseases (acne rosacea, scleroderma), to make a direct relationship rather certain. There are a number of persons without free hydrochloric acid in the gastric secretions in whom none of these etiologic factors are demonstrable. In our records, forty-two cases were found which fell under some one of the foregoing classifications. Chronic cholecystitis and carcinoma of the stomach were not included, since the absence of acid in the former is rather constant, in older patients at least, and in the latter is actually constant. There were fifty-one cases of achlorhydria which had to be classified as primary, as none of the recognized causes for the absence of free hydrochloric acid were present (table 1).

We are calling this entity achlorhydria, rather than achylia, because the latter term presupposes an absence not only of free hydrochloric acid but also of the gastric

* From the Department of Medicine, the Nicollet Clinic.
* Read before the Section on Gastro-Enterology and Proctology at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 14, 1928.

ferments, rennin and pepsin, whereas achlorhydria signifies merely the absence of free hydrochloric acid. In order to use the term achylia properly, rennin and pepsin must be found lacking by test, and free hydrochloric acid must be absent after histamine stimulation.[1] We have reason to believe that these primary achlorhydrias are actually achylias, but since we have not done the complete examinations on every one of the gastric contents, we will have to be content with the term achlorhydria. In discussing pernicious anemia later, we will use the term achylia to avoid confusion, since it has been found that the gastric contents of patients with pernicious anemia are actually achylic.

TABLE 2.—*Analysis of Fifty-One Cases of Primary Achlorhydria*

"Positive" family histories		6	
1. Mother died of pernicious anemia	3		
2. Father died of pernicious anemia (Brother has pernicious anemia)	1		
3. Father died of pernicious anemia (Two sisters have achylia)	1		
4. Daughter has achylia	1		
"Suggestive" family history (Mother died of unknown diarrhea with anemia)		1	7
"Possibly suggestive" for achylia or pernicious anemia		6	
1. Brother died of "stomach trouble"			
2. Mother has liver trouble			
3. Brother died of "anemia," thought to be tuberculous			
4. Brother died of "cancer" of liver			
5. Mother died of "cancer" of liver			
6. Father died of cancer			6
			13
Past history suggestive of long-standing achylia (diarrhea, indigestion, anemia, sore tongue)			22
Physical observations suggestive of early pernicious anemia (impaired vibration sense, glossitis, atrophic tongue, icteric sclera, skin pigmentation, tender sternum)			11
Blood observations—Index 0.90-1	10		
Index 1 +	7		
Hemoglobin 70 or below	7		
Red blood cells, 4,000,000 or below	7		
White blood cells, 5,000 or below	7		

Four explanations for primary achlorhydria have been suggested. The early explanation of Ewald, that such a condition was the result of glandular atrophy, anadeny, has been disproved by the finding of perfect glandular elements in some cases of achylia. Einhorn and others, admitting the anatomic perfection of the glands, postulated a functional deficiency, placing the cause in certain nervous influences. This explanation has not seemed entirely satisfactory. Martius admitted the functional atonic idea, but declared it to be on the basis of some constitutional or structural defect. Faber,[2] in his turn, refused to accept such a view, or indeed any of the others, and stated that the condition of achylia was always due to a gastritis, meaning by that term not necessarily an inflammatory condition but a functionally deranged and disorganized glandular mechanism somewhat akin to the general conception of nephritis or hepatitis. In more informal communications, he has since modified these views to conform to the constitutional idea of Martius. In other words, the true achylias are probably constitutional glandular deficiencies. Martius, Faber and Hurst [3] have finally come to an essential agreement. Hurst goes further and includes, at least for the achylia as found in pernicious anemia, the idea that the condition is not only constitutional but actually hereditary and familial. Our own studies incline us to this opinion, as we hope to show.

There are several obstacles in the way of establishing the hypothesis that primary achlorhydria is a constitutional defect. In the first place, studies on children have not been extensive, and those which have been made are not without criticism.[4] There are so many dietary and infectious and febrile factors which might produce even temporary achlorhydria in infants that conclusions from such material have to be made with great care. The ideal manner of establishing the facts would be to find a group of newly born infants with no free hydrochloric acid in their stomachs, and to follow them through life. Such an undertaking is manifestly impossible.

No proof can come from the study of the usual postmortem material, because of the well known changes which occur so early in the gastro-intestinal tract immediately after death. Hayem, and later Faber,[5] tried to get better preservations of specimens by the intraperitoneal injection of formaldehyde immediately post mortem, but even the sections thus obtained were not perfect from the histologic standpoint. We have sections from a case of known achylia (pernicious anemia) which were obtained from the stomach after it had been filled with formaldehyde by stomach tube, almost as the patient drew her last breath. These sections are almost perfect and do not show postmortem changes. There is a general atrophy of the mucosa and glandular elements, which is marked. This atrophy also includes interstitial and muscular elements. However, it is not possible to draw conclusions concerning the factors which could produce an achylia from the study of so few histologic specimens as are available.

There are clinical data which tend to show that primary achlorhydria is in all probability a familial or hereditary condition. In the series of fifty-one patients with primary achlorhydria, six were found whose family histories showed other members having this condition, and by the very best of evidence; namely, the occurrence of pernicious anemia. Achylia occurs in 100 per cent of patients with pernicious anemia; therefore, these ancestors with pernicious anemia must all have been achylic. In one other case the history stated that the mother died of "diarrhea and anemia," which is at least suggestive of pernicious anemia (table 2). We did not include such lay diagnoses as stomach trouble, anemia, jaundice or cancer, any of which might easily have been pernicious anemia. In the cases of secondary achlorhydria studied there was not a single instance of pernicious anemia in the family (table 3). In a series of 112 cases of pernicious anemia recently studied, there were found six "positive" family histories and also six that were suggestive (table 4). Thus, it is seen that a positive history of pernicious anemia (achlorhydria) is present in at least 12 per cent of the cases of primary achlorhydria and

TABLE 3.—*Analysis of Cases of Secondary Achlorhydria*

Positive family histories		None
Suggestive family histories		None
Past history suggestive of longstanding achylia		3
Physical observations suggestive of early pernicious anemia		None
Blood observations:		
Index, 0.90-1	5	
Index, 1 +	2	
Secondary anemia	10	
Leukopenia	8	

1. Wright, C. B.: Minnesota Med. **11**: 73 (Feb.) 1928. Berglund, Hilding; Wahlquist, H., and Sherwood, K. K.: Proc. Soc. Exper. Biol. & Med. **20**: 4, 1924.
2. Faber, Knud: Am. J. M. Sc. **172**: 1 (July) 1926; Faber, Knud; and Gram, H. C.: Relations Between Gastric Achylia and Simple and Pernicious Anemia **34**: 658 (Nov.) 1924; The Association of Achylia and Anemia of Different Types in Three Members of the Same Family, and the Behavior of the Color Index in Pernicious Anemia, ibid. **34**: 827 (Dec.) 1924.
3. Hurst, A. F., and Bell, J. R.: Brain **45**: 266 (Oct.) 1922.
4. Block, C. E.: Ugesk. f. Læger **85**: 1, 1923.
5. Faber, Knud; and Block, C. E.: Nord. med. Ark., 1899, number 20.

in from 6 to 12 per cent of the true pernicious anemia series.

Further evidence in favor of the constitutional factor in achlorhydria may be found through a study of the past histories for symptoms indicative of the early absence of acid. The records of the fifty-one primary cases show that in twenty-two of them there were historical data indicating a long-standing achlorhydria, in some instances dating back to childhood, and in most covering an appreciable period of years. Such symptoms were diarrhea, indigestion, food idiosyncrasies, bilious attacks, spells of anemia and sore tongue (table 2). When the secondary achlorhydrias were compared, only three cases were found showing any evidence that an achylia might have existed before the symptoms of the acual disease entity itself began. The

TABLE 4.—*Analysis of One Hundred and Twelve Cases of Pernicious Anemia*

Positive family histories	6 cases
Suggestive family histories	6 cases
Past history suggestive of long standing achylia (before onset of pernicious anemia symptoms)	44 cases

cases of pernicious anemia showed figures analogous to those in achylia, namely, suggestive long-standing past histories in forty-four cases (table 4).

A consideration of these historical facts brings one to the supposition that, after all, primary achlorhydria may be indicative of some other state existing or about to exist in the individual. Careful physical examinations reveal minor signs which alone mean little but which, taken together, point very definitely in the direction of pernicious anemia. In eleven of the fifty-one primary achlorhydrias, physical observations were demonstrated which were suggestive of early pernicious anemia, such as icteric sclerae, atrophic and glossitic tongues, skin pigmentations, early age changes (gray hair), tender sternums, and impairment of vibration sense over the extremities (table 2). In the forty-two cases of secondary achlorhydria there were none of these suggestive signs of pernicious anemia (table 3). Furthermore, the blood examinations in the fifty-one cases showed ten patients with indexes of 0.9 to 1 and seven with indexes of 1+. There were only seven cases of the secondary type of anemia and only four cases of leukopenia (table 2).

In the secondary achylias there were only two patients with indexes greater than 1 and five with indexes between 0.9 and 1. There were, however, ten cases of secondary anemia and eight cases of leukopenia (table 3).

The series of 112 patients with pernicious anemia includes four known to have had primary achylia for years, who subsequently, under our observation, developed pernicious anemia.

REPORT OF CASES

CASE 1.—Mrs. M. A. N., aged 40, gave a history of having had digestive disturbance since 1901. In 1919 achylia was first actually determined by gastric secretory analysis.

Oct. 19, 1919, examination of the duodenal contents showed urobilin 600 (normal). Neurologic examination was negative.

In 1920 the hemoglobin was 73 per cent; the red blood count, 4,600,000, and the white blood count, 8,000. Neurologic examination at the Mayo Clinic was negative.

In 1922 the hemoglobin was 78 per cent; the red blood count, 4,184,000.

In 1925 the hemoglobin was 75 per cent; the red blood count, 4,180,000, and the white blood count, 5,400, with an index of 0.91.

Smears were negative for pernicious anemia. Examination of the duodenal contents showed a total of 19,000. No colon bacilli were present. Neurologic examination was suggestive of pernicious anemia; a tabetic-like curve was noted.

The final diagnosis was pernicious anemia.

CASE 2.—Mrs. A. H. P., aged 74, had been found to have achylia in October, 1923, but the history showed that it had been present fifteen years before, together with an absence of hydrochloric acid. Blood examination in 1923 showed: hemoglobin, 77 per cent, red blood cells, 3,930,000, and white blood cells, 8,250. No other physical abnormalities were found. Neurologic examination was negative. The diagnosis then made was chronic cholecystitis.

In January, 1926, the patient complained of sore tongue, which, on examination, showed atrophy and glossitis. There was icterus of the sclera and a tender sternum. At this time, the hemoglobin was 36 per cent; the red blood count, 1,790,000, and the white blood count, 5,900, with an index of 1. The patient was put on a liver diet.

In March, 1926, the hemoglobin was 73 per cent; the red blood count, 2,490,000, and the white blood count 5,050, with an impaired index of 1.5. The vibration sense was slightly over the great toe.

In June, 1926, the hemoglobin was 40 per cent; and the red blood count, 1,830,000, with an index of 1.1.

The final diagnosis was pernicious anemia.

CASE 3.—Mrs. T. M. McD., aged 66, who, in October, 1925, gave a history of having had "bilious attacks" all her life, was found to have achylia. At this time blood examination showed: hemoglobin, 76 per cent; red blood cells, 4,300,000, and white blood cells, 6,800, with an index of 0.88. Neurologic examination was negative. No other abnormalities were found. The diagnosis then made was arteriosclerosis and chronic cholecystitis.

In June, 1926, the patient presented slight icterus of the sclera, and slight atrophy of the tongue. Blood examination showed: hemoglobin, 42 per cent; red blood count, 1,610,000, and white blood count, 4,100. Smears were typical for pernicious anemia. The patient was put on a liver diet.

In July, 1926, the hemoglobin was 42 per cent; the red blood count numbered 1,820,000, and the index was 1.1.

In August, the hemoglobin was 65 per cent; the red blood count numbered 2,940,000, and the index was 1.1. There was a slight impairment of the vibration sense over the lower extremities. The final diagnosis was pernicious anemia.

CASE 4.—Mrs. E. J. M., aged 42, gave a history of sick headaches in April, 1926, at which time achylia was found. Blood examination showed: hemoglobin, 40 per cent, red blood count, 3,280,000, and white blood count, 6,900, with an index

Blood Examination in Case 1 in 1919

Month	Hemoglobin	Red Blood Cells	White Blood Cells
April	58%	2,400,000	5,800
May	59%	3,040,000	
June	57%	4,000,000	
November	65%	3,888,000	

of 0.62. An old mitral lesion from rheumatic fever was present. Neurologic examination was negative. The diagnosis was migraine and early menopause.

In May, blood examination showed: hemoglobin, 47 per cent; red blood count, 3,120,000, and white blood count, 4,750, with an index of 0.75. Neurologic examination was negative. The patient complained of sore tongue.

In September, the hemoglobin was 49 per cent; the red blood count, 3,160,000, and the index, 0.79. Smears suggested only secondary anemia.

In October, blood examination showed: hemoglobin, 53 per cent; red blood cells, 3,660,000, and the index, 0.73. The tongue showed some glossitis. Examination of the duodenal contents showed: urobilinogen, 7,200; urobilin, 6,800; bilirubin 4+.

The "torpid" type of pernicious anemia was suspected.

In November, the hemoglobin was 52 per cent; the red blood count, 3,500,000, and the white blood count, 6,550, with an index of 0.74.

In December, the hemoglobin was 41 per cent; the red blood count, 3,500,000, and the white blood count, 5,500, with an index of 0.60. As the patient was having excessive uterine bleeding at this time, roentgen-ray therapy was given.

In May, 1927, the hemoglobin was 42 per cent; the red blood count, 2,800,000, and the white blood count, 4,050, with an index of 0.75. In July, the hemoglobin was 45 per cent; the red blood count, 3,520,000, and the white blood count, 6,500, with an index of 0.64.

In January, 1928, the hemoglobin was 41 per cent; the red blood count, 3,070,000 and the index, 0.68. Neurologic examination showed impaired vibration sense over the extremities. There were atrophic changes of the tongue and also glossitis.

The final diagnosis was pernicious anemia.

COMMENT

It is interesting in this connection to speculate on the individual who develops a pernicious anemia syndrome following a subtotal gastric resection and the consequent achylia. This situation, as originally noted by Hartman,[6] has also been observed by us in two cases, but in both of these the blood picture remained that of a secondary anemia, although both developed symptoms and signs of cord involvement. Ivy, however, has recently shown on dogs that such a condition of anemia is not permanent. His gastrectomized dog did develop an anemia which persisted for about a year, but after that time the blood returned to normal and still remained so after four years. Therefore, a state of permanent anemia does not necessarily follow.

The cases of secondary achlorhydria are much more likely to show an anemia of secondary type, which is, however, due to the underlying cause and not to the achlorhydria per se. On the other hand, there are many patients with pernicious anemia who show all through their course only a secondary type of anemia with an index of 0.50. Morawitz[7] has called these cases "torpid" anemia associated with achylia. Our experience has been that patients of this type eventually develop rather marked cord symptoms and usually die a "cord" death, simulating tabes.

As further evidence that these cases are of a constitutional type, Arnoldi and Schlecter[8] have sought to prove that the condition of gastric achylia was simply a part of a functional deficiency, including the liver, the pancreas and the stomach. They have evidence which shows that the secretions of all these organs are more or less simultaneously affected; that in certain liver conditions the gastric secretions are more abundant (hyperacidity) and in others they are suppressed; that when the duodenal contents show increased pigment values, a true achylia exists, and when there is a total increase of bile of low pigment content there is increased or normal gastric acidity, or an achylia from some other source. These facts are confirmatory of the work of one of us[9] as to the finding of increased pigment values in pernicious anemia. In the present series of cases, in which duodenal contents were studied in the achylia due to other causes, uniformly low values were obtained. When any increase in the bile pigments was found, it was in the case of achylia, which was actually a pernicious anemia or under suspicion of being a pernicious anemia from other evidence.

It does not appear that a state of primary achlorhydria necessarily predisposes to the development of pernicious anemia, but persons with primary achlorhydria who present historical evidence that the condition is on an hereditary or constitutional basis will finally reveal symptoms and signs of idiopathic pernicious anemia.

There is probably some infectious factor added to this primary predisposition. We have found a streptococcus in the active glossitic areas by biopsy section and culture of the specimen.[10] It seems likely, then, that this infectious agent invades the gastric tissues in those persons already constitutionally lacking in resistance, as shown by the achylia. This infection, in itself, by this method of invasion, may then be operative to produce an anemic state.

CONCLUSION

1. There is a condition of primary achlorhydria existing in certain individuals, probably on the basis of some constitutionally defective factor, showing a definite hereditary and familial tendency.

2. There need not be, at least for many years, demonstrable signs or symptoms arising from this condition, but an appreciable number of such persons do show certain historical and physical data which indicate that they may develop an idiopathic pernicious anemia.

3. In data pertaining to pernicious anemia there is abundant evidence that the condition of achylia exists for many years before other indications of the hemolytic anemia are evident, and that in pernicious anemia there is also a familial and constitutional genesis.

4. Therefore, primary achlorhydria is significant of the possible existence of an idiopathic pernicious anemia, particularly if there are hereditary, historical or physical data pointing to such.

5. When a history of recurring glossitis and achlorhydria is found, there is every reason to suspect idiopathic pernicious anemia, regardless of the blood picture.

1009 Nicollet Avenue.

ABSTRACT OF DISCUSSION

DR. HILDING BERGLUND, Minneapolis: The occurrence of achylia in pernicious anemia families has been proved in few instances. Dr. Schneider has several beautiful illustrations of that type. I myself last week proved a complete achlorhydria in a 19 year old daughter of one of my older patients with pernicious anemia. Among the numerous facts brought out by the authors, I want to emphasize one. I find achlorhydrias, just as they did, in a considerable number of patients with secondary anemia. In secondary anemias of rather a chronic type, we find definite or easily interpreted cases in women between 25 and 40 who have fairly marked anemia with the hemoglobin remaining for years around 50 per cent. These cases not infrequently show achlorhydria. One practical conclusion is that in a case of anemia with achlorhydria, one cannot, because of the achlorhydria, make the first diagnosis of pernicious anemia, but in a case of pernicious anemia, one cannot very easily sustain that diagnosis unless achlorhydria is present. Whether most cases of secondary anemia with achlorhydria will later on develop into pernicious anemia has to be studied. It is not likely, because competent hematologists have reported that it is rare for patients with pernicious anemia to show an early picture of secondary anemia, while cases of secondary anemia with achlorhydria are common. Therefore, it is very improbable that these secondary anemias will develop into pernicious anemia. This is important from the point of view of a prognosis, and it is our duty to give this encouragement to the patient.

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DR. GEORGE B. EUSTERMAN, Rochester, Minn.: The authors have had a wide experience and an enduring interest in diseases of the hematopoietic system and their pronouncements are usually orthodox. They have differentiated concisely achlorhydria, anacidity and achylia. These terms are often used interchangeably and may lead to confusion. In the Mayo Clinic, under certain circumstances, we differentiate achlorhydria (which may have little clinical significance in the absence of retention, blood or mass) and true anacidity by the histamine test, or this may be determined by the hydrogen ion concentration of the gastric contents, as emphasized by Bloomfield and Keefer in their recent research. Most instances of true anacidity are seen in cases of advanced gastric carcinoma, gastric syphilis, pernicious anemia, and chronic gastritis. The work of Bennett and Ryle, Vander Hoof, Faber and others has revealed the incidence of achlorhydria in adults. One of my colleagues, Dr. Connor, recently carried on investigations germane to the subject which have not as yet been published. Among other things he examined the gastric contents of 161 subjects in all decades of life, who were blood relatives of patients with pernicious anemia. Achlorhydria was present in 28.3 per cent of the total number; in 48.8 per cent at the age of 40 or more, and in 14.7 per cent at the age of 39 or less. Allowing for Bennett and Ryle's normal group of 4 per cent with achlorhydria, it is highly probable that this high percentage of achlorhydria in relatives of patients with pernicious anemia is of real significance. Such a statistical study including all decades has not been previously reported to my knowledge.

DR. JOHN L. KANTOR, New York: If the results of all the test meals of a large series are taken and divided according to decades, one will find that the incidence of achlorhydria increases sharply with the age of the patient. Dr. Sagal and I have been accumulating this kind of evidence, and we have about 3,000 cases. Unfortunately, I have not the exact figures, but I think I can make clear what I have to say. In the first decade, the incidence of achlorhydria is about 3 or 4 per cent. The increase is steady, and the curve is regular all the way up, so that in the sixth decade (there are not sufficient figures in the seventh to make it interesting) the percentage is 33. That means that any one who reaches the age of 60 or more has a one-third chance of not having any free acid in his stomach. I was very much pleased and interested to note that the authors divide achlorhydria into primary and secondary because I make that division, too. There is a reason for such a division. In the primary form, the total acidity is low, say from 4 to 10 degrees on the classic Jaworski scale. This type, as I understand it at present, is a pure neurosis and is not associated with any other disease. In secondary achlorhydria the acid dissociation is greater so that the total acidity is 20 per 30 degrees. All cancers seem to be associated with the secondary group, rather than with the primary. The exact classification of pernicious anemia is to my mind still unclear. Finally, it is possible that the increased incidence with age is due to the increase in secondary, rather than in primary, achlorhydria, so that the age incidence curve represents a mean between the two forms. Obviously, much work will have to be done before we can settle this problem.

DR. FRANK SMITHIES, Chicago: I should like to ask the authors whether these achylias and achlorhydrias were determined by the fractional method always, and whether more than one observation was made on each of these patients. My experience has been that, very frequently, the so-called normal time of sixty minutes is not sufficient in certain stomachs to bring out the secretion, and hence there are false achylias or achlorhydrias; that is, up to sixty or sixty-five minutes. After that time, or another hour, if one follows the test, I find that these patients secrete a fairly normal quantity of acid. Hence, it seems to me we must examine patients more than once and over a period of time longer than what we formerly thought was necessary to develop the acid secretion. I should also like to know how frequently in the bacteria-free stomach contents there has been found achlorhydria in the presence of the peptic ferment. Further, it would appear that we should not stamp cases as achylias or achlorhydrias until we have proved them to be so by the histamine test and by repeated fractional studies. I was very much pleased to note that the authors again go back to Hunter's old theory of infection as an etiologic factor in pernicious anemia. I am convinced that while, just now, we are extremely enthusiastic over the high vitamin diet "cure" of pernicious anemia there are other etiologic factors to be considered. In pernicious anemia, one wonders whether some agent, such as infection, has not been an influence in preventing the utilization of available vitamins. Certainly, it seems that in a few years we shall be revising our opinion. It is well that we should not be so optimistic and dogmatic as we are with regard to the curative value of liver diet and rich vitamin food in pernicious anemia. Have they cured a single patient?

DR. SEALE HARRIS, Birmingham, Ala.: As to the family tendency in pernicious anemia, I had a patient with pernicious anemia who died about five years ago, and the daughter of this man came to me a year ago and I found that she had an achlorhydria, with a slight secondary anemia. After a brief period of rest and some liver feeding, the hydrochloric acid returned in normal amount and the blood count went up to 5,000,000. Now whether or not there is a tendency in that young girl to pernicious anemia I do not know. In other cases I have not been able to trace the family tendency in pernicious anemia. As to the occurrence or the incidence of pernicious anemia in patients who have had an achlorhydria, one of my patients, a man who had had pellagra in 1917, had a complete absence of hydrochloric acid in his stomach. He was put on a diet rich in meats, milk, eggs and vegetables, and a high vitamin diet, and he recovered completely from his pellagra, but the achlorhydria has persisted. Four years ago he developed pernicious anemia. I fed him a rich vitamin diet and a high protein diet, without improvement. He was given twenty-seven transfusions with only temporary improvement each time; finally, when the liver treatment came in, I put him on the Murphy-Minot diet and his blood count went from about 1,200,000 to 5,300,000. I think that if I had not stopped him from eating so much liver, he would have developed polycythemia. The point I want to bring out is this: Pernicious anemia seems to be secondary to infections of the liver, and the same infection affects the stomach, producing gastritis and destroying the hydrochloric acid forming cells. The feeding of liver cures pernicious anemia but it does not bring about a return of the hydrochloric acid or affect the cord changes. It therefore seems to me that there is infection of the liver, of the stomach and sometimes of the spinal cord in pernicious anemia. The essential lesion, however, is in the liver, a hepatitis, which destroys the liver cells that secrete an antihemolytic endocrine. In other words, in pernicious anemia there is a deficiency of the liver endocrine which controls erythrocytolysis.

DR. C. B. WRIGHT, Minneapolis: Clinical proof that a given patient has not and will not secrete hydrochloric acid is difficult. If it could be demonstrated that certain persons are born without an acid-secreting mechanism, we would be on firm ground. As far as I know, such a condition has never been demonstrated. Even in pernicious anemia, in which there is a condition of permanent achlorhydria, only part of the cases, according to Faber, will show very serious injury to the acid-secreting cells. There is a group of cases in which there is no evidence whatever of pernicious anemia that will not show evidence of free hydrochloric acid with the ordinary fractional test meal. In part of these cases, however, free acid will be present after the injection of histamine. I found this to be true in a third of the cases. In 1924 I gave test meals to 250 children between the ages of 6 and 15 and found four without free hydrochloric acid. One year later I examined two of these children again, and in one I did not find acid and in the other I found a small amount. The other two I could not examine. The one not showing any acid on the two occasions one year apart showed acid four years later, at the age of 16, in normal amount. The younger the persons examined, the less achlorhydria. In adults in whom one finds no acid in from 10 to 15 per cent of the cases, the finding of a family without acid might be explained on the basis of accident.

DR. J. B. CAREY, Minneapolis: Dr. Berglund cautioned against forcing a diagnosis of pernicious anemia on those persons who have secondary anemia and achlorhydria. We did not intend to force such a diagnosis, only indicating that such persons should be kept under observation for a long period of time, in order that the earliest indications of the development of a subsequent primary anemia may be picked up. Dr. Euster-

man's figures bear out our studies on the occurrence of achylia in the families and relatives of patients. We have many patients with pernicious anemia one or more of whose relatives we have found to have achylia without anemia at the time of our examination. I wonder whether the 3 per cent of achylia that Dr. Kantor found in the first decade of life might not include the type of individual that we are talking about in this paper, namely, the one who is constitutionally achylic. We feel that primary achylia is the result of some constitutional defect; therefore, the 3 per cent that Dr. Kantor has found is probably the percentage that runs through the whole series. When the percentage rises, later in life, to 33, the secondary factors which we mentioned in our paper are encountered. In answer to Dr. Smithies' question about the fractional method of gastric analysis, we have done such examinations in a sufficient number of cases of both pernicious and secondary anemia to indicate to us that there was an actual absence of free hydrochloric acid. In those cases in which we have not used the fractional method, we have done repeated single gastric analyses. In most doubtful cases we have examined the duodenal contents, obtaining either low or high pigment values, thus giving further evidence of the absence or presence of pernicious anemia. We have not used histamine, as we stated in our paper. With regard to Dr. Harris' remarks concerning etiology, there has been a good deal said about the etiology of pernicious anemia at this session of the American Medical Association, so we will, for the time being at least, add nothing, but simply rest on our idea that eventually an infectious agent will be found contributory to the fundamental defects mentioned in this paper. Dr. Wright's four cases in children are probably also of the same type that Dr. Kantor mentioned; namely, constitutional achlorhydria. The occurrence of achylia in families may be coincidental, of course, but that question cannot be answered without a very large series of examinations.

PRACTICAL VALUE OF LIVER FUNCTION TESTS

A COMPARATIVE STUDY *

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AND
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Although recent interest in liver function tests has been productive of much information and has developed many new methods, the hope that a single test would be found that could fulfil all requirements for adequately estimating liver function has thus far failed. No single test up to now can actually measure more than one specific function of the liver, whether metabolic, secretory or retentive. The large amount of work done in this field began with the contribution of Rowntree, Hurwitz and Bloomfield [1] in 1913, when they first called attention to the use of halogenated phthaleins as a means of testing the functions of the liver.

Our studies were carried out over a period of four years on almost 300 patients referred to the gastroenterologic clinic at the Hospital of the Graduate School of Medicine of the University of Pennsylvania. All the more important tests have been tried out at some time during this work. In order to eliminate the personal equation as a factor in our results, all of the tests have been performed by one of us (Rothman). We have discarded as unsatisfactory the Widal hemoclastic crisis test, the determination of the coagulation time of the blood, the indicanuria, phenoltetrachlorphthalein, phenoltetraiodophthalein sodium and dextrose and levulose tolerance tests, and the determination of the appearance time and the collection of dye by means of the duodenal tube. Among these might also be mentioned the qualitative van den Bergh reaction. Those tests which have survived and still seem to us to be of some value are the serum bilirubin estimation (icterus index or quantitative van den Bergh), the bromsulphalein dye test and the urobilinogenuria determination. More recently in an effort to determine the value of metabolic liver function tests, we have carried out combined blood and urine studies for the retention and the excretion of sugar and uric acid.

EVALUATION OF TESTS

Bromsulphalein has proved thus far the most satisfactory of the dye tests. The original method of Rosenthal and White [2] has been followed, except for slight changes.

The icterus index was estimated according to the method of Bernheim [5] and comparisons were made in a microcolorimeter. The icterus index in our hands has proved simpler and just as satisfactory as the quantitative van den Bergh test in estimating the blood serum bilirubin. We recognize readings of from 4 to 6 as normal, between 6 and 15 as indicative of latent jaundice, and above 15 as showing clinical jaundice.

Urobilinogen tests were carried out according to the method of Wallace and Diamond.[6] Hawk and Bergeim [7] considered this method even more delicate than the spectroscopic method of Wilbur and Addis.[8]

The use of the combined method of estimating uric acid in the blood and urine, as a liver function test, is based on the work of Mann [10] and his associates on dogs. We recognize the fact that the metabolism of uric acid in man and the dog is not entirely similar. The supposition is that when the liver is injured there occurs a definite increase in the output of endogenous uric acid and an abnormally great increase in the exogenous output. Parallel increases should occur in the uric acid of the blood.

Although the levulose and dextrose tolerance tests have been found generally unsatisfactory as tests of liver function, the galactose tolerance test has been used with apparent success abroad by Davies [16] and Bauer.[17] For that reason we have felt justified in carrying out studies along this line.

In a small group numbering eleven cases, we tried out the phenoltetraiodophthalein sodium test in comparison with other liver function tests. The informa-

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* Owing to lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the authors' reprints.

* Read before the Section on Practice of Medicine at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 13, 1928.

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tion which was obtained from the use of this dye was not as reliable as that derived from other liver function tests. For this reason and because of the violent reactions that occurred, as well as the fact that the substance is expensive and its administration time-consuming, we promptly abandoned the test.

TYPES OF CASES STUDIED

The tests for liver function, as described, were carried out in a varied group of cases, such as are encountered as a routine in any gastro-enterologic clinic. Many of the patients had obvious disease of the liver. In a large group, however, there was no clinical evidence of hepatic disease. No selection of cases was attempted, and the tests were applied indiscriminately with the hope that we might be able to throw some light on their value in the recognition of liver dysfunction. Several tests were done on each patient, and as most of the patients were under observation for a considerable period of time, it was possible to repeat these tests from time to time and to note such variations as occurred in the course of the various diseases studied.

For purposes of analysis and comparison, we have grouped the material studied according to the diagnosis, and have attempted to analyze the value and results of liver function tests according to the various diseases.

The first group comprised cases of cirrhosis of the liver. These have been divided into the cases of portal cirrhosis, chronic hypertrophic obstructive biliary cirrhosis, and Banti's disease. The results of our observation in the cirrhoses of the liver are shown in chart 1.

In this and in the three succeeding charts the information sought is stated at the head of each column. The shaded perpendiculars represent the percentage of cases under each heading in which positive results were obtained. The numbers under the charts represent the average, the high and the low readings obtained in the various liver functional tests performed.

The seventeen cases of portal cirrhosis are further subdivided into those with ascites (eleven cases) and those without (six cases). There was no reasonable doubt as to the diagnosis in all the cases of cirrhosis with ascites. In this group, the liver was definitely enlarged in 40 per cent. In 20 per cent the spleen was also increased in size. Jaundice occurred at some time during the course of the disease in 40 per cent. It is interesting to note that in two of our cases a well marked caput medusae was present. A striking feature of the liver function tests was the frequency with which dye retention occurred; 87.5 per cent showed an abnormal delay in bromsulphalein elimination. Dye retention was always more marked when the patients were jaundiced. In 66.6 per cent there was an increase in serum bilirubin. As a rule this was slight. During the periods of jaundice, the icterus index was never high enough to suggest any marked degree of biliary obstruction. Remarkable increases occurred in the urobilinogen (87.5 per cent), ranging from 1-30 to 1-500 or more. It was noticeable that dye retention, serum bilirubin and urobilinogen all increased in the presence of clinical jaundice, but the increase in the urobilinogen was invariably disproportionately high. There is no question that in definite portal cirrhosis there consistently occurs a noteworthy retention of dye and a marked increase of urobilinogen. The figures obtained varied with the clinical course of the disease, but, as the degenerative changes in the liver gradually dominated the picture and the cases approached their termination, the amount of dye retained and the quantity of urobilinogen found in the urine steadily increased and often reached considerable proportions, and we found, as did Greene [19] and his co-workers, that the amount of dye retained bore a definite relationship to the ascites.

There were seven cases of portal cirrhosis without ascites. It is admitted that this group presented greater diagnostic difficulties. The cases included in this small group were either confirmed by autopsy or operation, or else there was a definite alcoholic history with hepatic enlargement for which no other explanation could be found. A third of this group showed definite, though slight, retention of dye. In no instance was serum bilirubin increased, but a definite increase in urobilinogen occurred in two thirds of the cases. It is interesting to note in passing that 75 per cent either had marked gastric subacidity or an achlorhydria. We are led to feel that in cases of suspected portal cirrhosis, if dye retention occurs and if the urobilinogen is increased, the diagnosis of cirrhosis may be made with reasonable certainty, but when these tests are entirely negative, early cirrhosis of the liver may still exist, but possibly in a state in which liver parenchymal regeneration predominates. Here the history is of greatest importance.

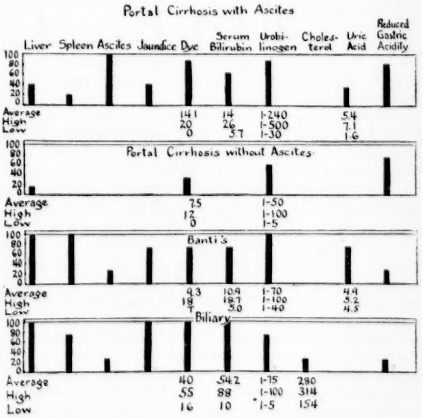

Chart 1.—Liver function tests in cirrhosis of the liver.

In our series we never encountered an instance of so-called Hanot's cirrhosis. Four cases of chronic hypertrophic obstructive biliary cirrhosis, however, were studied. All these patients showed definite dye retention, which at times went as high as 55 per cent, and averaged 40 per cent. Serum bilirubin was obviously increased. The jaundice fluctuated but never became latent. In all but one case urobilinogen was definitely increased. The increase never amounted to more than 1-100 and at no time did it approach that encountered in portal cirrhosis. The single instance of low urobilinogen was due to an almost complete extrahepatic obstruction. Cholesterol was always increased, and the amount found in the blood varied with the degree of biliary obstruction, being higher in the extrahepatic type. In only one case was there an hypochlorhydria.

19. Greene, C. H.; McVicar, C. S.; Anell, A. M., and Rowntree, L. G.: Diseases of the Liver, Arch. Int. Med. **40**: 159-181 (Aug.) 1927.

In the four patients with Banti's disease who came under our observation, three showed a slight increase in dye retention. In every case a definite but moderate increase in urobilinogen occurred. Serum bilirubin was also found slightly increased. Jaundice, which was usually high, fluctuated, but for the most part was found latent. Cholesterol in the blood was never found increased.

In the second group of cases studied, jaundice was the outstanding symptom. Hemolytic states were not included in this group. Our results are recorded in chart 2. The patients with jaundice have been sub-

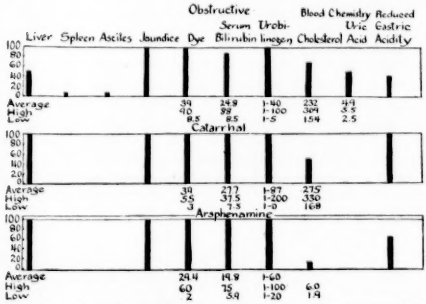
Obstructive
Liver Spleen Ascites Jaundice Dye Serum Bilirubin Urobilinogen Blood Chemistry Cholesterol Reduced Uric Acid Gastric Acidity
Average 39 249 1-40 232 4.9
High 40 99 1-100 309 5.5
Low 8.5 8.5 1-5 154 2.5
Catarrhal
Average 39 27.7 1-87 275
High 55 37.5 1-200 330
Low 3 7.5 1-9 168
Arsphenamine
Average 24.4 14.9 1-60
High 60 75 1-100 6.0
Low 2 3.4 1-20 1.9

Chart 2.—Liver function tests in obstructive jaundice, catarrhal jaundice and arsenical jaundice.

divided into (1) those in whom jaundice was due to some obstruction other than carcinoma; (2) those suffering from the so-called catarrhal jaundice, and (3) those in whom the jaundice was the result of the administration of organic arsenic preparations, such as tryparsamide.

In the obstructive jaundice group, fourteen cases were studied. As the obstruction became greater and the jaundice more marked, a definite increase was noted in the degree of dye retention and in the serum bilirubin. These followed progressively along parallel lines. An increase in urobilinogen was also noted as the obstruction progressed up to the point nearing complete obstruction. When complete obstruction occurred, the urobilinogen disappeared from the urine. If, however, the obstruction was removed, the serum bilirubin and dye retention gradually disappeared with the jaundice but the urobilinogen appeared increased in moderate quantities. The urobilinogen remained increased so long as there was a hepatitis present, and it may therefore be looked on as a valuable index of liver injury. We have also noted that in cases of chronic obstructive jaundice, when obstruction is relieved, dye retention diminishes more slowly than does the icterus index. We found the highest cholesterol values in these cases of obstructive jaundice, with an average of 232 mg. per hundred cubic centimeters of blood. In half of the cases the blood uric acid was also increased and averaged 4.9 mg. per hundred cubic centimeters of blood.

In the ten patients with catarrhal jaundice studied, in all of whom the liver was slightly palpable, we found that jaundice increased rapidly in intensity but disappeared slowly. Dye retention and increase in the serum bilirubin always paralleled the degree of jaundice. In the beginning of catarrhal jaundice, urobilinogen was slightly increased; then, as the jaundice reached its height, only a trace might be found or it might be entirely wanting. However, as the jaundice subsided, the urobilinogen appeared at its highest value, and slowly declined until weeks or months after all evidences of clinical jaundice had disappeared; when it may still be increased. This is probably due to the residual hepatitis that is present, and again leads us to believe that urobilinogen is most valuable as an index of liver injury. With the subsidence of jaundice, dye retention decreases and becomes normal in from three to four weeks. The icterus index also rapidly diminishes, but readings indicative of latent jaundice may persist along with the urobilinogen for many weeks.

One of the most interesting groups of cases studied was that in which jaundice developed as the result of organic arsenic injections. These patients were referred to us because of gastro-intestinal complaints. We have followed in all fourteen cases of this type. In this class of jaundice the onset is insidious. This suggests the value of having liver function tests done on all patients who receive arsenic intravenously, for in this way a developing hepatitis might be recognized before serious changes have taken place in the liver and further injury may be prevented. In arsenical jaundice, the degree of jaundice, its duration and the amount of liver dysfunction are exceedingly variable, and evidently depend on the degree of liver injury that has occurred. In arsenical jaundice, the degree of dye retention and the increase in serum bilirubin are never as high as that observed in obstructive or catarrhal jaundice, nor does the increase in urobilinogen compare with that found in cirrhosis complicated by jaundice. In all the cases studied, we found a definite degree of dye retention and an increase in the icterus index and in the urobilinogen. Dye retention remained disproportionately high, even after the serum bilirubin was normal. This suggests that in arsenical jaundice a true hepatitis exists rather than merely a cholangeitis. In arsenical jaundice, bile drainage shows a free flow of bile at all times, indicating further that the jaundice is not the result of an obstruction so much as a hepatitis. This group of cases clearly illustrates the danger of assuming that, when jaundice occurs in those who are receiving arsenic, the jaundice is due to syphilis of the liver rather than to the therapeutic agent. Two patients, still under observation, show latent icterus and dye retention three years after the onset of the jaundice, and this may be an index of permanent liver injury.

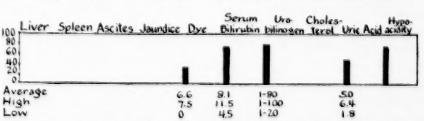
Liver Spleen Ascites Jaundice Dye Serum Bilirubin Uro-bilinogen Choles-terol Uric Acid Hypo-acidity
Average 6.6 8.1 1-90 5.0
High 7.5 11.5 1-100 6.4
Low 0 4.5 1-20 1.9

Chart 3.—Liver function tests in untreated patients with positive Wassermann reactions without enlargement of the liver or spleen or jaundice.

A third group of cases that we studied, eight in number, represented patients with positive Wassermann reactions who had not received any antisyphilitic treatment and who did not present any gross clinical evidences of liver disease. These patients all came to the dispensary suffering from conditions such as gallstones, gastric ulcer, gastric syphilis, tabes or aortic aneurysm. The syphilitic condition was discovered accidentally after routine study. Our observations are presented in chart 3.

Although the series is small, it seems significant that the dye retention, averaging 6.6 per cent, occurred in

37.5 per cent of these patients. Some increase in urobilinogen, averaging 1-80, occurred in 75 per cent, and serum bilirubin increased to an average of 8.1 per cent was noted in 71.4 per cent. A like number had low gastric acidity. It may therefore be stated that, in this group of patients with positive Wassermann reactions but no evident liver disease, some hepatic dysfunction, as indicated by functional tests, occurred in the majority. Eight additional patients with syphilis, who were receiving treatment had no evidence of liver dysfunction.

We have also studied fifteen cases of carcinoma of the stomach without positive clinical evidence of metastasis to the liver. The results obtained in this fourth

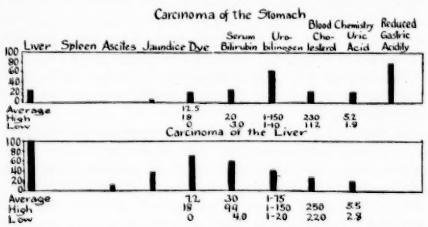

Chart 4.—Liver function tests in carcinoma of the stomach and of the liver.

group were variable. In only four of the group was there any evidence of liver dysfunction. In these four patients definite dye retention occurred, with a slight increase in the serum bilirubin. This increase never amounted to more than latent jaundice, except in one instance in which clinical jaundice developed. Of this group of patients with carcinoma of the stomach, 63 per cent did show an increase in urobilinogen, up to 1-150. As was to be expected, 78 per cent of the patients had an achylia gastrica or a marked hypochlorhydria. Our observations in this and the following group are found in chart 4.

The cases of carcinoma of the liver were studied in a separate group. There were eleven of these. Every patient had an enlarged liver; 40 per cent had jaundice, and 10 per cent had ascites. In 70 per cent, dye retention occurred which was only moderate, the highest amount recorded being only 18 per cent. In 60 per cent there was an increase in the serum bilirubin, with an average of 30 per cent. Increases in urobilinogen up to 1-150 were noted in 40 per cent of the total studied. There was no uniformity in the blood chemical observations. No matter how much involvement of the liver parenchyma took place, it was our observation that definite evidences of liver dysfunction, as indicated by the tests, did not occur until marked biliary obstruction had taken place. The patient who had the largest liver, practically filling the entire abdominal cavity, showed 9 per cent dye retention six months after the development of the abdominal mass, a urobilinogen of only 1-40 and an icterus index of 7.5, which indicated only latent jaundice. Nine months after the onset of symptoms, this patient developed clinical icterus. The slight evidences of liver dysfunction, as indicated by the tests in such a case, emphasized the tremendous factor of safety that exists in the liver and the compensatory rôle that unaffected liver cells are able to play, an observation that has frequently been made by many investigators.

The fifth group comprised the cases of gastric and duodenal ulcer, which numbered twenty-seven. These were studied with the idea of determining whether or not there was any evidence of an associated liver disease. Except for a slight increase in serum bilirubin in 31.5 per cent of the cases, there was no suggestion of liver dysfunction obtainable by any test that was employed. It is possible that the increase in serum bilirubin may have been the result of an associated low grade ascending infection of the biliary tract.

A small group with diabetes (group 6) came under our observation. In spite of the fact that the liver was enlarged, there was no definite consistent evidence of liver dysfunction demonstrable by any of the liver function tests, except in those cases in which gallstones or other hepatic disorders occurred with the diabetes.

Our seventh group consisted of cases of gallbladder disease, of which there were forty-four. These were divided first into the cases of chronic cholecystitis without stone, seventeen in number. In none of these were there enlarged livers, palpable spleens, jaundice or ascites. Bile retention was never observed. Serum bilirubin was normal. The urobilinogen as well as the chemical condition of the blood did not show any significant departure from the normal. However, in all our cases of chronic cholecystitis the bile drainages invariably showed various degrees of biliary tract inflammatory disease. The liver function tests failed to show any evidence of dysfunction.

Another division of this group (twenty-four in number) comprised cases of gallstones with chronic cholecystitis. The liver was large in 20 per cent of these cases; jaundice was present in 41.5 per cent, and 50 per cent showed definite dye retention, but whenever this occurred there was evidence of some hepatitis or biliary obstruction. As a rule the urobilinogen was unaltered, except in the presence of a hepatitis from biliary obstruction. In four instances, urobilinogen was increased up to 1-50 when no jaundice was present, suggesting some uniform involvement of the liver parenchyma. There was no consistent change in the blood cholesterol or in other chemical constituents of the blood. There was no convincing evidence of liver dysfunction, unless jaundice was present. Seventy-five

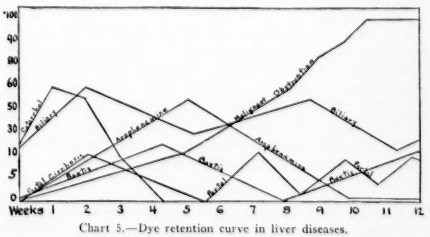

Chart 5.—Dye retention curve in liver diseases.

per cent of these cases were diagnosed by the finding of calcium bilirubinate pigment and crystals of cholesterin and leucine in the bile during duodenal drainage. In fifty per cent there was a gastric hypo-acidity.

The third division of the cases of gallbladder disease consisted of three cases of carcinoma of the gallbladder, found at operation. Two patients had large livers and were jaundiced. In these two patients there was dye retention, an increase in serum bilirubin and urobilinogen as might be expected, due to metastases

to the liver. Our observations with liver function tests in simple biliary tract and gallbladder disease force us to the conclusion that they do not show any evidence of liver dysfunction unless some degree of biliary obstruction is or was present.

Our ninth group included a number of patients suffering from various disorders, such as chronic passive congestion of the liver, severe anemia, chronic constipation and achylia gastrica of unknown etiology.

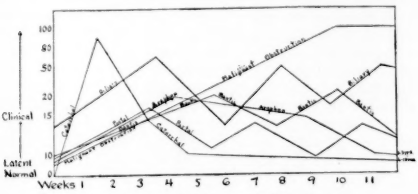

Chart 6.—Serum bilirubin curve in liver diseases.

In the group of patients who had chronic passive congestion of the liver due to cardiac decompensation, the liver was enlarged, ascites was present, and two were jaundiced. In all these cases urobilinogen was increased. There was a slight tendency to increase in the serum bilirubin, even when there was no jaundice. In the jaundiced cases, obviously, the increase was marked. Dye retention was not of any great importance. Slight or no retention was observed in all cases except one, and in that case jaundice was present.

Liver function tests were carried out in a small group of patients who presented either marked secondary anemias or primary pernicious anemia. Although three fourths of these had large livers, none had dye retention. One half of the patients had hypobilirubinemia and, except in one, urobilinogen was normal. Slight increases or decreases in serum bilirubin were observed in pernicious anemia. This variability depended on the time of the examination, and whether there was increased destruction of red blood cells going on or an attempt at blood regeneration taking place. In short, no conclusive evidence of liver dysfunction could be demonstrated in the cases of severe anemia.

A series of patients was studied in whom chronic constipation was associated with a group of symptoms alleged to be due to hepatic toxemia. In every one of these cases the liver function tests which were done failed to show any evidence of dysfunction.

A similar conclusion was forced on us when liver function tests were carried out in a series of cases of achylia gastrica of unknown origin.

COMMENT

As we have had an opportunity to observe a large number of cases over a considerable period of time, we have attempted to plot the average course of the serum bilirubin, dye retention and urobilinogen during the progress of the disease in the groups studied. The way in which these estimations vary as the diseases in question progress is shown in charts 5, 6 and 7.

Mention should be made of the results which we have obtained with the galactose tolerance test as an index of liver function. The combined estimation of the galactose in the blood and the urine was done after the manner described. The procedure was carried out in twenty-four cases. The patients studied were selected because they represented different types of definite liver disease. At least two or more were selected from those suffering from obstructive jaundice, Banti's disease, biliary and portal cirrhosis, arsenical jaundice, catarrhal jaundice and carcinoma of the liver, in addition to several normal persons. In only one of this series, in spite of the fact that the majority had gross disease of the liver, was there a positive result. This patient had portal cirrhosis with syphilis, and the other liver functional tests were definitely positive. There was a galactose excretion of 3.4 in the urine accompanied by a rise of 64 mg. per hundred cubic centimeters in the blood.

Our studies have been too limited to justify any definite conclusions. So far as our experience goes, however, we are led to believe that galactose is of no value as a test for liver function in chronic hepatic disorders. Originally the test was employed in the differentiation of acute hepatitis, but for even this purpose it is of no distinct value, so far as our observations go.

In view of the acknowledged importance of the liver in uric acid metabolism, we undertook the study of the uric acid in the blood and urine of patients first on a purine-free diet and then on standardized high purine diets. In addition to a group of normal persons, patients were selected who had definite evidences of hepatic disease, such as biliary and portal cirrhosis, arsphenamine jaundice, catarrhal jaundice and Banti's disease. In the patients with definite liver disease, the endogenous output of uric acid varied between 0.122 and 0.87 Gm. In a case of portal cirrhosis with syphilis, and in another case of Banti's disease, the endogenous output was increased; and in the former case after a high purine diet, there was an excretory rise of 0.714 Gm. In the case of Banti's disease the output of exogenous uric acid in the urine amounted to 0.74 Gm. In neither case did the total output of uric acid amount to from 1 to 2 Gm., which is looked on as normal.

Our results with the so-called metabolic liver function tests have been distinctly discouraging. So far the number of cases studied has been too small to

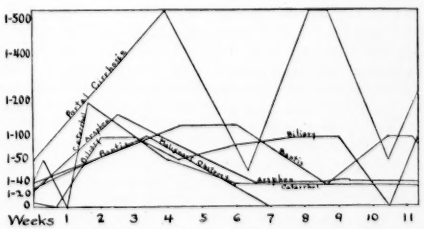

Chart 7.—Urobilinogen curve in liver diseases.

justify drawing positive conclusions, but work is being continued along these lines. Thus far, however, in our experience, even in those cases in which positive results were to be expected, the amounts of galactose and uric acid found in the blood or urine never did more than approach high normal readings.

We undertook this review of our observations on liver function tests on a considerable number of patients suffering from various disease conditions, with the idea of determining (1) whether it was possible to recognize

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liver dysfunction before there was any clinical evidence of liver disease by any of the so-called liver function tests, and (2), in cases that presented definite evidence of hepatic disorder, which tests of liver function were of practical clinical value and yielded information of prognostic and diagnostic importance.

In patients without demonstrable liver disease, slight increase in dye retention and urobilinogen suggested the existence of an unsuspected hepatitis. In portal cirrhosis without ascites, for example, the slight delay in dye excretion and increased urobilinogen were of positive diagnostic value.

In patients who were suffering from obvious liver disease, an increase in urobilinogen and serum bilirubin with dye retention were found with sufficient constancy and frequency to lead us to believe that these tests are of definite value. It is the rule to find all of these tests more positive in the presence of biliary obstruction. Their chief value was not so much in confirming the diagnosis of liver disease, which was clinically obvious, as in furnishing data of prognostic value by which the progress and duration of the liver dysfunction could be followed. This is well illustrated in the cases of jaundice from various causes, excepting the hemolytic types. Long after clinical jaundice subsided, the serum bilirubin showed the existence of latent jaundice. Even more striking was the increase in urobilinogen after all other manifestations of liver disease had disappeared, indicating the persistence of a hepatitis. In portal cirrhosis with ascites, a steady increase in the positive evidences of liver dysfunction invariably heralded unfavorable developments in the disease.

CONCLUSIONS

As a result of our study, we believe the following conclusions justified:

1. Of all the liver function tests thus far devised, those of greatest clinical value and general usefulness are (1) the estimation of urobilinogen; (2) the determination of serum bilirubin (either by the quantitative van den Bergh test or, better, by the icterus index), and (3) the estimation of the degree of retention of the dye bromsulphalein.

2. Urobilinogen is probably the most delicate single test for liver dysfunction. It is always increased, even when the injury to the parenchyma is slight or when excessive blood destruction brings about an increase in bile pigment formation. In our experience, urobilinogen is constantly increased to a noteworthy degree in portal cirrhosis. Slight increases in urobilinogen have been noted from time to time in a limited number of patients in whom liver disorder was suspected, but not evident clinically. In many conditions a persistent increase of urobilinogen was indicative of a residual hepatitis.

3. The presence of latent icterus, as revealed by serum bilirubin estimations, is of distinct importance both diagnostically and prognostically, because in this way even slight degrees of bile retention may be determined.

4. The retention of bromsulphalein is valuable confirmatory evidence of liver dysfunction. Such retention rarely occurs unless one or both of the liver function tests already mentioned are positive, with the exception of portal cirrhosis, in which dye retention occurred in the absence of hyperbilirubinemia. In our experience, 2 mg. per kilogram of body weight of this dye is as accurate as the larger 5 mg. dose.

5. Our limited experience leads us to believe that the metabolic tests for liver function, namely, galactose tolerance and uric acid, are of little value in the study of both acute or chronic hepatic disorders and are too time consuming and cumbersome to be of clinical value.

ABSTRACT OF DISCUSSION

DR. C. W. DOWDEN, Louisville, Ky.: Apparently it is generally agreed that no single test has so far served to measure the entire functional capacity of the liver. When gross injury exists, all tests are positive. Clinical signs and symptoms first direct attention to the liver. Once the liver is implicated, the difference in opinion as to the value of the several tests seems on close analysis to revolve around the fact that our knowledge of physiologic function is insufficient or in some instances not duly appreciated. Do positive results indicate impaired permeability or extrahepatic obstruction or do they indicate actual injury to the liver cells, inability to detoxicate or, in fact, evidence of actual disturbance of function? With regard to bilirubinemia, what part does the reticulo-endothelial apparatus, of which the Kupffer cells of the liver are a part, play in the production and storing of bilirubin? Is the jaundice, which in most instances parallels the quantity of serum bilirubinemia, due to extrahepatic obstruction? To what extent does blood destruction enter into the positive test? In positive galactose, fructose or levulose tests one wonders to what extent the pancreas, the hypophysis or chronic passive congestion are responsible. Certainly they have little or no value in mild dysfunction. To be of value, studies of nitrogen partition must include estimation of amino-acid nitrogen in the blood, exclude renal factors, and allow for absorption of amino-acid nitrogen by other tissues. In my experience there has not been any consistent variation of uric acid from normal. Dye tests have value in connection with bilirubinemia and in differentiating types of cirrhoses, but they are not a positive indication of disturbed total function. And, further, they are not wholly eliminated by the liver. Theoretically at least, the determination of urobilogen in the urine should, and probably does, offer just as early and just as accurate evidence of disturbed function as any other test. It is very simple to perform and embraces more than one function of the liver. Little has been done to determine the detoxicating power of the liver, probably its most important function. Vesell and Sherwin have found that when 5 Gm. of para-aminobenzoic acid is given and the urine is saved for twenty-four hours, the normal liver acetylates 68.5 per cent during that period and this represents 100 per cent efficiency. In gross injury, as from malignant disease, none is acetylated. The amount acetylated seemed to agree with the degree of disturbance and coincided with the clinical picture. Chronic nephritis, uremia, chronic passive congestion and other extrahepatic factors did not influence the test. If this test can be simplified, it would seem to offer a more accurate index of liver function than any other yet developed.

DR. ROGER S. MORRIS, Cincinnati: The criterion of any functional test in the clinic is, Does it aid materially in the diagnosis and prognosis of disease? The phenolsulphonphthalein test of renal function, introduced by Rowntree and Geraghty, is a brilliant example of a useful functional test in clinical medicine. The value of proposed tests for liver function can be determined only by such studies as the authors have reported today. The results of the use of such tests in our clinic are quite similar to those reported by the authors. The tests do not, as a rule, materially aid in the diagnosis or prognosis of liver diseases, we feel. Those which we have used most frequently have been the van den Bergh and icteric index tests and the urobilinogen test in the urine. These tests, as compared to the renal functional tests, we feel, are rather disappointing in the results yielded. Experience thus far reported with hepatic functional tests indicates the need for further experimental studies in the hope of finding new methods which will have greater value in the clinic. One of the points which Drs. Piersol and Rothman emphasized indicates the need of greater caution than we customarily employ in the use of arsenical preparations in any case in which there is reason to suspect liver disease. The long persistence of evidence of disturbed liver

function which he has reported indicates that the injury may be more severe in many cases than we anticipate.

DR. L. G. ROWNTREE, Rochester, Minn.: In Drs. Piersol and Rothman's report, I was interested in a statement concerning the relative value of the color index in the van den Bergh test. I think that what they say is essentially correct. However, there are a few instances in which more can be obtained through the use of the van den Bergh test than by the bile index. The van den Bergh test has a certain differentiating value in determining the type of jaundice in a considerable proportion of cases. We have used bromsulphalein and phenoltetrachlorphthalein in dye retention interchangement, and I agree with the authors that the advantage is in favor of bromsulphalein. I am glad to learn of the importance which they attach to urobilinogen. If they had said urobilinogen or bile products, I would be in perfect accord. I should like to ask whether or not urobilinogen has differential diagnostic value relative to catarrhal or obstructive jaundice. All these tests have to do with the excretory functions of the liver. To date, little or no progress has been made from the standpoint of determining the metabolic functions of the liver. Another phase of this work which has not been touched on but which will be of general interest to the profession is the question of bile salts of the blood in relation to the liver function test. Miss Aldrich of our laboratory has developed what we call the "Pettenkofer value of the blood," a test for bile acids. Bile acid value of the blood will not occupy a place as a great test of liver function, but the bile salts are of great importance in determining the mechanism of the productive symptoms as they occur in liver disease. We have already learned from the study of many cases that there is no direct causal relationship between the level of bile salts in the blood and pruritus brachycardia and changes in the coagulation time of the blood. As a functional guide in liver disease we depend chiefly on the level of serum bilirubin in jaundiced patients and on the dye retention in nonjaundiced cases. In the same connection, studies of coagulation time are of great importance from the standpoint of the patient suffering from liver disease. Perhaps the greatest good that has come out of the use of tests of liver function to date is the more intensive investigation of liver disease on the part of the internist. Internists have not had a deep interest in this matter. The surgeon has been forced to study the question because of the ever-present jaundice and gallstones, but we have been "asleep in Zion" so to speak, and in need of a great revival. The clinical investigations of this type, that is, the study of the function of organs in disease, are the province of the practicing physician. The "fundamental" men, as a rule, do not have access to clinical material; consequently, if we are to make progress in the study of disease, we, the practicing physicians, must undertake clinical investigations of this nature.

DR. FRANK SMITHIES, Chicago: We owe a great debt of gratitude to Drs. Piersol and Rothman for "clearing the decks" regarding the various liver function tests, even though they have dealt only with the excretory function of the liver. Their thesis saves us a great deal of unnecessary work. I wish to emphasize the practical significance of these investigations with regard to cases which are going to be submitted to surgical operation. It is our rule and practice, whenever the liver is palpable before an operation, and when there is obvious disease of the gallbladder and bile ducts, to inform the surgeon as to the results of such liver function tests as have been carried out. If these tests show definite injury to the liver, it is suggested to the surgeon that he should not perform a cholecystectomy but institute long continued drainage of the liver ducts after the fashion of former years. We have found this to be extremely helpful in this type of case. When this is done, we have fewer of these patients returning to us after operation with comparatively the same symptoms as they had before. The next thing is that before the patient is discharged from the hospital, one should make it a practice again to repeat the tests to see whether there is any difference in the excretory function of the liver. I think this is of importance, particularly with regard to prognosis and the administration of special diet and therapy. I would caution those who have listened to this paper and have derived great benefit from it that there may be extensive disease of the liver, as cyst, tumor or localized cirrhosis, in which the functional tests may be entirely normal and yet, on account of "liver reserve," the patient may be sick enough to die, when from all the indications the liver function tests have been favorable.

DR. GEORGE MORRIS PIERSOL, Philadelphia: In answer to Dr. Dowden's question, we haven't been able to make any differentiation between the extrahepatic obstruction and jaundice so far. I am glad Dr. Smithies emphasized the fact that in spite of these functional liver tests, or because of them, patients can be seriously ill with grave liver disease. I have referred to that, and we have repeatedly seen such instances in which these tests were entirely negative or so slightly positive as to be of little significance yet, at autopsy or operation, extensive liver disease was found. Even in the case of carcinoma, this is sometimes true, and is another instance of the extraordinary ability of the liver cells to take on excretory functions.

SYNERGISM OF MAGNESIUM SULPHATE AND MORPHINE

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This communication is called forth by the repetition of statements to the effect that "no satisfactory evidence has been brought forward to show that the synergism of magnesium sulphate and morphine occurs in animals or in man." [1]

To my knowledge, the following definition of synergism has not been challenged: [2]

> By synergism (a Greek derivative meaning "working together with") is meant the reciprocal augmentation of the action of one drug by that of another. This reciprocal augmentation of the action of one anesthetic agent by that of another induces the state which has come to be known as synergistic anesthesia when accompanied by unconsciousness, and synergistic analgesia when the subject is conscious. The effect of the synergistic action of drugs goes beyond a simple summation of similar pharmacological actions, either in prolonged or deepened action, or both. For example: morphine and magnesium sulphate have a prolonged effect; whereas with ether and magnesium sulphate the effect of the ether is deepened: indeed this action of drugs is much greater than the summation of their pharmacological actions. No satisfactory explanation of synergism can be given.[3]

Criticism of any new procedure, to be fair and of value, must be based on the procedure as carried out by the one who proposes it, not in accordance with the ideas of the one who criticizes, and who, in many instances, is apparently unfamiliar with the method. For example: one pharmacist,[4] in a further criticism of the synergism of magnesium sulphate and morphine, shows that he does not understand this action when he says: "The presence of the magnesium sulphate did not enable smaller doses of morphine to overcome the pain."

Neither I nor any one else at any time has hinted that "smaller doses" of morphine could be used "to overcome the pain" in the presence of magnesium sulphate in any amount. What I said is that "it seems to act mechanically with morphine, holding it in contact with the tissues longer than morphine can maintain such contact alone." [5] Hence, as I have distinctly stated, the

1. Hatcher, R. A.: The Rectal Administration of Ether and Oil, and Morphine, Magnesium Sulphate and Ether in Surgery and Obstetrics, J. A. M. A. **89:** 2189 (Dec. 24) 1927.
2. Gwathmey, J. T.: Anesthesia, p. 640.
3. Meyer, H. H., and Gottlieb, R.: Pharmacology, 1914, pp. 510, 575.
4. Beckman, Harry: The Alleged Synergism of Magnesium Sulphate and Morphine, Am. J. Obst. & Gynec. **15:** 72 (Jan.) 1928.
5. Gwathmey, J. T.: Current Progress in the Science and Practice of Anesthesia, J. A. M. A. **77:** 421 (Aug. 6) 1921.

same amount of morphine must be used with magnesium sulphate as with sterile water. In other words, one-eighth grain of morphine is not converted into one sixth or one sixth into one fourth or one fourth into one half.

The use of magnesium sulphate as a synergist (and not merely as an addition) has been clearly and definitely established clinically. The clinical test is the final one for the practicing physician. An analysis of the first classic case [6] in which the potentiation of morphine was established beyond all reasonable doubt is in order.

Morphine in water alone was given twice, with a total elapsed time for the suppression of pain of five and one-half hours.

The average time for suppression of pain was two hours.

Morphine in magnesium sulphate was given to the same patient seven times, with a total elapsed time for the suppression of pain of ninety-four and three-fourths hours.

The average time for suppression of pain was thirteen hours.

Here is an increase of more than 500 per cent in value of morphine by the addition of an amount of magnesium sulphate (2 cc. of a 25 per cent solution of the salt) that when used alone is insufficient to suppress pain. Pain was seemingly suppressed for nineteen hours in the same patient by 3 cc. of magnesium sulphate alone, but this was subsequent to the previous injection of morphine and magnesium sulphate, and one has a right to conclude that a hang-over resulted. This seems to be proved by the fact that with the next hypodermic of magnesium sulphate alone, 3 cc. of a 25 per cent solution, there was severe pain after three hours, as by this time all the morphine had disappeared from the system.

This one clinical case alone would be worthless as evidence, but there are eighty-four other cases from two widely separated hospitals having no connection with each other to confirm and continue the comparison.

In the first series of cases, at the Presbyterian Hospital, New York: [6]

In fourteen surgical cases in which morphine and water were given there was an average time for the suppression of pain of four hours.

In sixteen surgical cases in which morphine and magnesium sulphate were given there was an average time for the suppression of pain of sixteen hours.

An increase in value of 300 per cent.

The patients in this series from the Presbyterian Hospital were given 400 cc. of a 4 per cent solution of magnesium sulphate (4 drachms, or 240 grains [15.5 Gm.], of the salt). This 4 drachm (240 grains) dose might possibly be interpreted as additive and not synergistic, but Smythe,[7] after using this technic for some time, stated:

Continued use of a 25 per cent solution in a large number of cases enables me to report that the analgesic effect of morphine is prolonged with equal certainty and success by a smaller dosage. We now rely upon three small doses of morphine, ⅙ grain each; with the second dose of morphine is added 1/150 of a grain of atropine; each dose is dissolved in 2 cc. of a 25 per cent solution of magnesium sulphate.

In the second series of cases, from the service of Dr. Frank D. Smythe (deceased), Memphis, Tenn.:

In twenty-seven surgical cases in which morphine and water were given the average time for the suppression of pain was four hours.

In twenty-seven surgical cases in which morphine and magnesium sulphate were given the average time for the suppression of pain was fifteen hours.

An increase in value of more than 250 per cent.

While 240 grains (15.5 Gm.) of the salt in the first series might be considered additive, 22 grains (1.4 Gm.) used in the second series cannot. Things that are equal to the same thing are equal to each other. Six cubic centimeters of a 25 per cent solution of magnesium sulphate alone given previous to an operation will not quiet pain at all after an operation. Three-eighths grain (24 mg.) of morphine given in divided dosage in water previous to an operation will quiet pain for four hours after an operation. Three-eighths grain of morphine given in divided doses in 6 cc. of a 25 per cent solution of magnesium sulphate will quiet pain for four times as long, or from fifteen to sixteen hours, an increase in value of from 250 to 300 per cent. This is definite synergism. Smythe stated:

Forty per cent of the patients thus prepared did not require an analgesic at all after operation. The appetite returned earlier because of the absence of pain and restlessness incident to the trauma inflicted at operation. Less nitrous oxide is required and a higher percentage of oxygen can be used than in cases when the morphine is given in sterile water. Fifty per cent of the cases required no ether. The patient is neither frightened nor apprehensive concerning the operation or its outcome. The stage of induction is greatly shortened and there is rarely a period of excitement.

In spite of these many advantages of the synergistic method, Davis [8] states, in referring to obstetric analgesia, "Pharmacologists question the value of adding the magnesium sulphate, and the carefully controlled animal experiments of Beckman indicate that it is better to omit it." Beckman's animal experiments from a clinical standpoint are worthless, as he did not use the magnesium sulphate as it is used clinically.

As already stated by Gwathmey and Hooper: [9]

The dose of morphine employed, 0.25 cc. of a 4 per cent solution per kilo, represents a dose of 10 mg. (one-sixth grain) per kilo or 110 mg. (1¾ grains) for a dog weighing 11 kilos (24.2 pounds). The dose of morphine is very large and out of all proportion to the amount of magnesium sulphate used. Beckman's experiments show definitely that the combined administration of magnesium sulphate and morphine in disproportionate amounts is not practicable and that it would no doubt prove decidedly dangerous in clinical application. The combination of magnesium sulphate and morphine as employed in our experiments (2 cc. of 50 per cent magnesium sulphate solution with one-eighth grain of morphine) is administered clinically almost constantly with no untoward results. Several thousand of these injections are now being given every month. Based on animal experiments a clinical dose of 2 cc. of 50 per cent magnesium sulphate solution administered subcutaneously or intramuscularly is at least 100 times removed from the fatal dose.

Beckman further states that issue can be taken with his work only when "it can be shown that exactly similar investigations have been made with entirely different results." I refuse to do this as his experiments do not disprove the prolonged effect of morphine when magnesium sulphate is used instead of plain water. Further animal experiments are not necessary, as any physician can prove the synergism of magnesium sulphate with morphine by alternating the synergist with water, as was done in the first case reported in this paper. Obstetricians who have used magnesium sulphate in obstetric analgesia say that they do not get within 50

6. Gwathmey, J. T.: Synergism of Magnesium Sulphate and Morphine, and Magnesium Sulphate and Ether, J. A. M. A. **85**: 1482 (Nov. 7) 1925.
7. Smythe, F. D.: Am. J. Surg. **37**: 85 (July) 1923; Memphis M. Monthly, 1922.
8. Davis, C. H.: Am. J. Obst. & Gynec. **14**: 807-808 (Dec.) 1927.
9. Gwathmey, J. T., and Hooper, C. H.: J. Lab. & Clin. Med. **10**: 641 (May) 1925.

per cent of the practical results when the magnesium sulphate is omitted.

Beckman states that the synergism of magnesium sulphate with ether and procaine has no bearing on the subject. With this I do not agree. Magnesium sulphate does potentiate the value of many drugs and in different ways. It is reasonable, therefore, to see that since it potentiates other drugs, all such experiments have a bearing on the synergism of the magnesium ion with morphine. It has been proved by Barbour and Winter [10] that "Combinations of amidopyrine with magnesium chloride in experimental animals exhibit antipyretic synergism and, to a lesser extent, diminished toxicity." Also, "Magnesium salts in mice appear to reduce the toxicity of the salicylates (protective antagonism). Magnesium augments the antipyretic action of sodium salicylate and of aspirin. When given subcutaneously with salicylate to fevered rabbits, the earlier stages of antipyresis are characterized by marked synergism."

The synergism of magnesium sulphate with morphine and procaine is life saving with laboratory animals when ether vapor is used as the anesthetic. The experiments of Gwathmey and Hooper [11] prove this conclusively. Four healthy albino rats were employed for each experiment. Two of the animals were given, intramuscularly, magnesium sulphate, procaine and morphine. Two animals served as controls and were not given anything. These animals were given the drugs as we use them clinically; i. e., before the anesthetic is given. The controls died within from eight to ten minutes. The synergized animals survived the anesthetic from twenty to twenty-five minutes. This shows an increase in value as regards life of 150 per cent.

Magnesium sulphate is put up in ampules alone, with morphine, or with morphine and 2.5 per cent of procaine. If the practitioner prefers, he can sterilize and make his own magnesium sulphate according to the formula of Auer, as follows: [12] "Weigh out 250 Gm. of magnesium sulphate and add enough water to make 1,000 cc., thus making a 25 per cent solution." A chemically pure magnesium sulphate must be used.

There is no more danger in administering morphine in 2 cc. of a 25 per cent solution, as far as life is concerned, than there is in administering the morphine in 2 cc. of water. I know this because, although it has been used in more than 10,000 cases of obstetric analgesia at the Lying-In Hospital, New York City, stillbirths have not increased.

Before accepting modifications and suggestions, it might be well for the obstetrician to familiarize himself thoroughly with the results of the standard technic and then omit the magnesium sulphate for comparison. Copies of the technic as it is being used at the Lying-In Hospital from 200 to 300 times each month will be sent on request to that institution.

If it can be proved that, by omitting the magnesium sulphate or anything else, better results can be obtained, the suggestion will be adopted.

CONCLUSIONS

1. The synergism of magnesium sulphate and morphine has been definitely proved clinically, in both obstetrics and surgery, the value of morphine having been increased from 250 to 500 per cent.

2. Experimentally, this synergism is life saving with laboratory animals when ether vapor is used as the anesthetic. Clinically, it is also life saving, decreasing both morbidity and mortality. It should be used with all methods of anesthesia and analgesia. Carefully kept records of synergistic obstetric analgesia in nearly 20,000 cases show that it is far superior to "twilight sleep" in every way.

3. The synergism of magnesium chloride with amidopyrine, sodium salicylate and acetylsalicylic acid has been proved in the laboratory by Barbour and Winter, and has an indirect bearing on the subject under discussion.

4. The synergism of magnesium sulphate and ether has been proved for the albino rat, rabbit, dog and man, and is of practical importance in relation to the synergism of magnesium sulphate and morphine.

5. The probability is that magnesium sulphate synergizes with almost any drug with which it is compatible, by prolonging its action, deepening its effect, reducing fever, or acting in other ways.

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10. Barbour, H. G., and Winter, J. E.: Proc. Soc. Exper. Biol. & Med. **25**: 582-587 (April) 1928.

11. Gwathmey and Hooper (footnote 9); Interstate Post Graduate Medical Ass'n of North America, Oct. 12, 1925, p. 92.

12. Gwathmey, J. T.: Anesthesia, ed. 2, p. 650.

AIR IN THE CORONARY ARTERIES*

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Entrance of air into systemic veins occurs with wounds of such large veins as the intracranial sinuses, the veins of the neck, the veins of the pregnant or puerperal uterus, and the veins of subcutaneous fatty tissue. Air also frequently enters veins torn in long bones, especially in the tibia, when such bones are broken.[1] The entrance is often marked by a hissing, gurgling or sucking sound [2] and is followed by a churning murmur in the heart [3] which has been compared to the sound of a mill wheel. There is also a rise in pulmonic pressure and a drop in systemic arterial blood [4] pressure, accelerated respiration, dyspnea, cyanosis, convulsions and coma. At times death occurs rather suddenly.

The explanations that have been made of how and why death results are not altogether satisfactory. Their inadequacy is mainly due to the absence of morphologic alterations such as we are habituated to associating with such a profound occurrence as death. Tamponading of the pulmonary artery and its branches with a frothy mixture of air and blood which is unable to traverse the pulmonary capillaries,[5] with futile contractions of the right ventricle of the heart,[6] and cerebral anemia are usually mentioned. Some reference is also made to the passage of air through the pulmonary vessels into systemic arteries.

* From the Norman Bridge Pathological Laboratory, University of Chicago, Rush Medical College.

1. Bergstrand, H.: Studies on Air Embolism, Acta path. et microbiol. Scandinav. **1**: 98, 1925.

2. Buiet, M. L.: Recherches expérimentales sur les emboles gazeuses, Bull. et mém. Soc. méd. d. hôp. de Paris **20**: 915, 1926. Keen, W. W.: Principles and Practice of Surgery, Philadelphia, W. B. Saunders Company **1**: 455, 1911.

3. Buiet (footnote 2, first reference). Gundermann, W.: Mill-Wheel Murmur in Heart, Mitt. a. d. Grenzgeb. d. Med. u. Chir. **33**: 78, 1921; Air Embolism, ibid. **33**: 261, 1921.

4. Bergstrand (footnote 1). Hazelhorst, G.: Experimentelle Untersuchungen über venose Luftembolie, Arch. f. Gynäk. **122**: 632, 1924.

5. Wolf, P.: Experimentelle Studien über Luft-Embolie, Virchows Arch. f. path. Anat. **174**: 454, 1903.

6. This has also been proposed to explain death from caisson disease by Henderson, Yandell; and Haggard, H. W., in Nelson's Loose Leaf Medicine, New York, Thomas Nelson & Sons **2**: 673, 1925.

The pulmonary capillaries are apparently quite a barrier to the passage of air from the right ventricle of the heart and pulmonary artery into the pulmonary veins and systemic circulation. By many the air is said to be absorbed into the blood before it can enter the blood of the pulmonary veins as gaseous emboli. The factors responsible for air in the pulmonary veins seem to be similar to those effecting its presence in systemic veins. The lung tissue is first wounded or torn, and then either air is sucked into the current flowing toward the heart or the pressure by breathing aids its ingress to the pulmonary veins. The pressure required to make minute lacerations in the delicate pulmonary parenchyma is not great. Apparently such small tears, the hemorrhages that follow and their importance as places through which air may enter the pulmonary veins failed to attract the attention of early observers. Bichat [7] evidently believed that hydrogen and other gases pumped into the lungs through the trachea passed directly into the blood through intact lung tissue. He was interested in demonstrating their presence in the blood and succeeded by exploding the bubbles of hydrogen in the blood from systemic arteries.

Pumping of air into the lungs was also employed by Ewald and Kobert [8] in studies to ascertain whether lung tissue is air proof. From elaborate experiments, they concluded that air may traverse intact lung tissue and escape into the blood vessels or pleural cavities when intrapulmonic pressure is increased to the limit consistent with life; that the short duration of increased pressure in ordinary normal respiration is insufficient to cause a passage of air from channels in which it normally courses, and that its egress to abnormal situations is promoted by straining at stool, childbirth, lifting, coughing and other exertions, especially those with which the thorax is compressed. They used curarized dogs and maintained artificial respiration with a water motor.

Ewald and Kobert were fully aware of the consequences of air in the pulmonary veins. They mention the demonstration by Dunin of air in the left ventricle and systemic arteries of a patient with phthisis who died abruptly after coughing, and mention also that air was found by Santorini in the systemic arteries of a man who died suddenly while blowing a trumpet after a hearty breakfast. Although Fuchs [9] found hemorrhages under the visceral pleura, he believed that air might pass into the pulmonary veins without tears of the lungs. When air was forced into the trachea of rabbits under a pressure of from 30 to 40 mm. of mercury, he always found air in the systemic arteries and right heart cavities.

In more recent contributions, there is practically no reference to the passage of air into blood channels through intact lung tissue. Schlaepfer,[10] for example, begins a discussion of air embolism in the pulmonary veins as follows: "Probably it would not occur to any physician to suggest that air emboli following such common technical procedures as puncture to clear up the nature of an effusion in the thoracic cavity or irrigation of a long-standing empyema with an antiseptic solution such as bichloride of mercury, peroxide of hydrogen or Dakin's solution, or change of the position of the tube draining such a cavity may cause complications that could endanger the life of the patient." He insists that when this variety of embolism follows such steps, bleeding always occurs from injury of the granulation or other tissue lining the cavities. The injured vessel found several times has always been a vein.

An experience of Brandes [11] is especially interesting. It illustrates the importance of pressure in the production of air embolism of the pulmonary veins, a factor that sometimes does not play a rôle, with the entry of air into systemic veins. The foreign substance found in the blood by Brandes, however, was not air but bismuth. He found it after death in the veins of the granulation tissue lining the empyema cavity, the pulmonary veins and various systemic arteries, including those of the cerebral cortex. He had endeavored to learn with bismuth and roentgenoscopy the extent and location of the cavity.

The symptoms accompanying air embolism of the systemic arteries are headache, dizziness, clonic or tonic convulsions, visual disturbances, aphasia, irregular respirations, Cheyne-Stokes breathing, cessation of respiration, a small, rapid pulse, involuntary defecation, and anemic patches of the skin from infarction. The symptoms vary considerably in duration, and may so vary even when death finally occurs from the embolism. Reyer and Kohl [12] report five deaths from air embolism into the pulmonary veins and systemic arteries following introduction of air into the pleural cavity to compress tuberculous lungs. Other patients recovered. Severe pain at the site of operation was complained of by 70 per cent of the patients and a similar proportion were in a sitting position or attempting to arise when the attacks began; severe visual disturbances occurred in 60 per cent, and unconsciousness in 60 per cent, and in 40 per cent the first symptom was nausea. From roentgen examinations, they concluded that 90 per cent of these patients with pulmonary vein and systemic artery air embolism had fibrous pleural adhesions. It is of particular interest that symptoms began in 40 per cent after the needle had punctured the chest wall, but before any air was actually injected. This definitely points to aspiration into torn pulmonary veins of air already present in the lungs and to the part which respiration may play in aiding the aspiration.

These symptoms following thoracentesis and other measures in which the lungs are likely to be injured were formerly attributed to pleural shock, an explanation now apparently replaced in the minds of many by embolism of air from the lungs into systemic arteries. Wever [13] found that all the symptoms of pleural shock were easily produced by injecting air into the carotid arteries, and Schlaepfer [10] was unable to obtain any constant reaction through the central nervous system or any symptoms simulating those which follow embolism of air into the pulmonary veins from irritating the pleura. The irritants that he used were mechanical, chemical and electrical; the animals were rats, rabbits, guinea-pigs and dogs. Many others have expressed opinions opposed to the theory of pleural shock, and by some it is not mentioned. Their accounts of severe symptoms or death are reported as results of the entrance of air into branches of the pulmonary vein,

7. Bichat, Xavier: Recherches physiologiques sur la vie et la mort, ed. 3, Paris, 1805, p. 303.

8. Ewald, J. R., and Kobert, R.: Ist die Lunge luftdicht? Arch. f. d. ges. Physiol. (Pflügers) **31:** 160, 1883. Ewald, J. R.: Ein Apparat für künstliche Atmung, ibid. **31:** 147, 1886.

9. Fuchs, L.: Luftembolie, Inaug. Diss., Kiel, 1913.

10. Schlaepfer, K.: Air Embolism Following Various Diagnostic or Therapeutic Procedures in Diseases of the Pleura and Lung, Bull. Johns Hopkins Hosp. **33:** 321 (Sept.) 1922.

11. Brandes, M.: Ein Todesfall durch Emboli nach Injektion von Wismut Salbe in eine Empyemfistel, München. med. Wchnschr. **59:** 2392, 1912.

12. Reyer, G. W., and Kohl, H. W.: Air Embolism Complicating Thoracic Surgery, J. A. M. A. **87:** 1626 (Nov. 13) 1926.

13. Wever, E.: Cerebrale Luftembolie, Beitr. z. Klin. d. Tuberk. **31:** 159, 1914.

and are without hint or suggestion of any other explanation.

Apparently there are still some who do not believe that pleural shock has been successfully controverted. For example, Crozier [14] has recently discussed the matter thoroughly and has definitely abandoned pleural shock for pulmonary air embolism. His experiments were with rabbits and he used iodine because of its easy chemical detection in the brain. Only when the lungs were wounded were convulsions, other severe nervous symptoms, or death of the animals observed, and similar consequences resulted when tincture of iodine or air was injected into the carotid arteries. The sole result of putting the tincture into the pleural cavities without wounding the lungs was a pleuritis, and the sequences attributed by Crozier to embolism were observed just as well when the vagi were sectioned.

Among other important details, we have become greatly interested in the presence of air in the coronary arteries and veins of guinea-pigs with pulmonary vein air embolism. Under ether narcosis, the trachea was cannulated with a Y tube. One of the outer arms was connected to a standard Tycos aneroid manometer, the other to rubber tubing bearing a pinch-cock, so that the passage of air through this arm could be closed or left open. This arm with its tubing was as long as the distance from the bifurcation of the trachea to the pharynx. After the animal had recovered from the anesthetic the arm was closed and air was forced into the lungs with a bulb under pressures equal to from 20 to 80 mm. of mercury. Twenty-two pigs were used.

The threshold above which air entered the pulmonary veins was about 30 mm.; in 40 per cent of the animals, between 24 and 30 mm. Above 30 mm. convulsions were invariable, first tonic then clonic. With 45 mm. of pressure or more, the pigs always died in from fifty to seventy-five seconds. Complete recovery took place in from two to five minutes when injections lasting about a minute failed to kill. The threshold was lowered by repeated injections, for after five injections, for example, at a pressure equal to 35 mm., given at intervals of five minutes, convulsions were readily produced with pressures of 25 mm. The amount of pressure registered fell rapidly immediately after injection from expansion of the lungs. In six animals the position of the diaphragm was examined to see whether it had been pushed down into the abdomen beyond its depth with normal respiration. No indication of abnormal distention of the thorax was found.

No air was found in the retinal vessels with an ophthalmoscope. It was sometimes found in the carotid arteries just before death. After death the bodies were examined under water at once. In all the guinea-pigs the lung parenchyma was diffusely speckled with petechial hemorrhages, but beneath the pleura this was particularly marked on the front and diaphragmatic surfaces. In various ways the escape of air from the terminal air sacs was evident. In all the animals there was some pneumothorax, with air in the aorta, carotid, brachial and iliac arteries and frothy blood in all the heart chambers. The right heart chambers were usually slightly tense and the left auricle contained more froth than the left ventricle. The pulmonary veins were always distended with froth, but the only systemic veins containing froth were the venae cavae near the heart. In six animals there were subepicardial petechiae near the coronary sulcus and along the front coronary artery.

There was always air in the coronary arteries. In three fourths of the animals it resembled silver filigree beneath the epicardium, the air filling from 50 to 90 per cent of the channels and being interrupted here and there with blood. When the mixture of blood and air was about equal, a cylinder of from 0.5 to 1 mm. of blood alternated with one of air; when the proportion of air was greater, the blood was more often at the spot at which the vessel branched, the air apparently selecting one of two possible paths, leaving the other as a shunt for the blood.

Histologic studies were made of material fixed in Zenker's solution and 10 per cent solution of formaldehyde from the cerebrum, cerebellum, brain stem, myocardium, lungs, kidneys and spleen with the usual stains and also sudan III and osmic acid stains of portions of the brain and myocardium. No hemorrhages were demonstrable in the brains and no acute fatty changes. In one pig kept alive twenty minutes and submitted to 35 mm. of pressure four times, there were distinct fatty changes in the myocardium of the front wall of the left ventricle and interventricular septum. These involved at least 20 per cent of the muscle fibers, consisted of zigzag, wavelike bands from 30 to 250 microns wide at right angles to the muscle fibers in general and were composed of fine fat droplets from less than 1 to 10 or 15 microns in diameter. In six pigs hemorrhages occurred into the myocardium, generally; these were usually from 15 to 60 microns long and spindle-shaped. They were seen only once in connection with subepicardial hemorrhages.

Different ways of accounting for the death of these animals demand consideration. The presence of air in the systemic veins is probably best accounted for by its passage through both systemic arteries and capillaries. Another possibility is a retrograde embolism into the pulmonary arteries, right ventricle and auricle, and such adjacent veins as the inferior cava and intrahepatic vessels, where it was encountered in a few animals. It has seemed to us, however, that such prompt death as the animals experienced cannot occur from this retrograde embolism, unless the venous discharge from the myocardium is blocked by air in the coronary veins. And it is true that air was often found in the coronary veins. This may have been due to passage from the coronary arteries, to the retrograde embolism mentioned, or to transition of both routes.

Explanation of the convulsions by air embolism into cerebral vessels has opposed to it failure to find any lesions in the brain, and the more cogent objection that convulsions are prone to follow any abrupt and marked obstruction of the arterial blood supply of the brain; strangulation is a good example. With cessation of arterial blood to the brain as a whole, focal lesions such as hemorrhage would be, to say the least, unlikely. Localized lesions in the lungs rarely result from obstruction of the pulmonary artery or its first divisions.

The third possibility, and one which, as previously stated, has secured our largest interest, is air embolism of the coronary arteries. In support of this way of interpreting death are its abruptness, the presence of air in the coronary arteries of all the animals and in the coronary veins of some, focal lesions in the heart muscle of some animals, and finally the fact that the heart also may possess no focal lesions whatever if a large part of its blood supply is abruptly obstructed and death occurs at once. There are other reports and statements in the medical literature, and other matters to be mentioned which have seemed to us to possess

14. Crozier, L.: Sur la pathogénie des accidents du pneumothorax, Rev. de la tuberc. **8**: 477, 1927.

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more cogency and pertinence at this point, now that the subject of air embolism in general has been brought, by degrees, to a consideration of the possibility and consequences of air in the coronary vessels.

An account of symptoms related by Brunerie [15] is of great interest in this connection in spite of his failure even to mention the possibility of air embolism. Epileptiform convulsions occurred soon after an attempt to compress a tuberculous lung in a woman who had previously submitted at intervals of many months to artificial therapeutic pneumothorax. A slight paralysis of one arm lasting four days was noticed after the acute symptoms subsided. But the account of Brunerie is particular. The course of what happened is related in detail. The needle was barely introduced when the woman coughed and expectorated material stained from fresh bleeding. As the needle was promptly withdrawn, the patient "at that moment" became very pale and the pallor was quickly replaced by congestion. Then she coughed up more blood-stained sputum several times before convulsions began. It is possible that the feeble, rapid pulse and cardiac arrhythmia noted later had already begun with the pallor, and that they were all associated with air in the coronary vessels. Pallor is also mentioned by Reyer and Kohl,[12] who discuss the possibility of coronary air embolism. One of their patients had an attack of syncope with the first puncture. Cyanosis and unconsciousness were very common symptoms.

Death of the guinea-pigs is intimately related to other ways in which death occurs and to some which have long been rather obscure. Among these are certain deaths in water, such as Ohlmacher [16] and many others have been disposed to account for by a status lymphaticus. Little or no water is found in the lungs, the bodies are sometimes excessively cyanotic, and many have been removed from the water before drowning was possible. These have frequently followed diving from a height and striking flat on the water with the abdomen, and in the lungs of such bodies hemorrhages are encountered.

The possibility of air embolism in the pulmonary veins with drowning has occurred to others. In a symposium on drowning before the annual meeting in 1906 of the German Society for Legal Medicine, Ipsen [17] asked his colleagues whether they had noted air in the pulmonary veins and left auricle from drowning. Nothing was said about its presence in the coronary vessels. Another possibility has been suggested by Bürger,[18] namely, a weak heart incapable of driving blood through the pulmonary vessels with the lungs acutely distended with air, which is perhaps retained by glottis spasm. Violent, abrupt constriction of the thoracic cavity before there is time for the lungs to become adjusted to the diminished room by expiration is also a result of the so-called solar plexus blows which sometimes cause prompt death. For such deaths the explanations have not been altogether satisfactory.

CONCLUSIONS

Experience with some forms of death of human beings, and with occurrences in which the approach of death has been close, and the results of experimental air embolism of the pulmonary veins and systemic arteries in guinea-pigs all indicate that postmortem examinations of human bodies should now and then be done under water or with other appropriate measures for demonstrating the presence or absence of air in the systemic arteries, and especially in those which supply the heart muscle.

In conditions with which air embolism is possible, and particularly embolism of the pulmonary veins, the patient should be promptly examined for peculiar churning murmurs of the heart whenever unexpected syncope is encountered and such examinations are feasible.

15. Brunerie, A.: Sur un cas de crise épileptiforme avec confusion mentale transitoire au cours d'une insufflation pour pneumothorax therapeutique, Lyon méd. **140:** 451, 1927.

16. Ohlmacher, A. P.: Bull. Ohio Hosp. Epilept., January, 1898, p. 56.

17. Ipsen, K.: Die Diagnose des Ertrinkungstodes, Vrtljschr. f. gerichtl. med., supplement *2*, **33,** 1907.

18. Bürger, M.: Ueber die Bedeutung des intrapulmonalen Drucks f. d. Kreislauf, u. d. mechanismus des Kollapses, Klin. Wchnschr. **5:** 825, 1926.

THE RELATIONSHIP OF HYPERTHYROIDISM TO JOINT CONDITIONS *

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Throughout the literature there have been comparatively few cases of so-called endocrine joint rheumatism associated with hyperthyroidism. I will present approximately fifty cases in which I have felt there could be no question whatever with reference to the intimate relationship between the hyperthyroidism and the joint manifestations. I have attempted to obtain exact information regarding the etiologic relations and trauma. It is a relatively common experience to have patients with hyperthyroidism complain of so-called rheumatism, and I am convinced that this combination of disturbances occurs more frequently than is supposed. One feels that a more painstaking eliciting of symptoms will reveal the prevalence of either transient or more persistent joint pain among these people. Certainly such has been my experience since this phase of the disease has been impressed on me. I do not intend to discuss the numerous aspects of endocrine arthritis or periarthritis in general, although one feels obligated to present certain features of this particular type of joint disease, since it is most logical to believe that with so marked a departure from normal metabolism in these cases there must be an associated disturbance of function in other sources of internal secretion.

Jaccoud [1] was probably the first to describe this particular type of chronic joint rheumatism. In his opinion, sufferers from this type of joint disease show striking signs of an anomalous constitution in the form of a more or less enlarged struma. From this he drew the conclusion that the arthritides are connected with endemic goiter. There exists, however, great diversity of opinion. These patients have been observed in what one might call the florid stage of the disease, and only with the lapse of time can one determine whether or not they are candidates for a more chronic deforming type of arthritis or for a protracted relief from joint deformity and pain. I believe the latter will be the case. The patients represented here have been hospitalized because of the obvious manifestations of hyperthyroidism, and each has been operated on following a preparatory period. Consequently I have been privileged to observe their reaction to various methods of approach and their failure to respond to anything other than the most radical methods of treatment.

* Read before the Section on Orthopedic Surgery at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 13, 1928.

1. Jaccoud, S.: Sur le traitement du rhumatisme articulaire aigu, Leçons de clin. méd., Paris, 1885, pp. 414-429.

REPORT OF CASES

CASE 1.—A lawyer, aged 55, presented himself because of nervousness, weakness, loss of weight and a rapid heart. About fifteen months prior to admission he began to lose weight and strength, and within two months he recognized the fact that he was becoming very nervous and that his heart rate was more rapid. These symptoms had increased steadily and were associated with a loss of 30 pounds (13.6 Kg.). He did not notice a goiter. On three occasions within the month prior to admission he had had a basal metabolic rate of from 40 to 60 per cent above normal. He had been approached by rest and the administration of ferrous iodide, and for three or four months prior to hospitalization had been using iodized salt. He had never at any time manifested evidences of joint abnormality. It is needless to state that on clinical examination he manifested the classic signs of a very marked hyperthyroidism. The gland was of the adenomatous type. Hospitalization followed, and within twelve days a bilateral ligation of the superior thyroid artery was performed. Along with this procedure he had been given compound solution of iodine and digitalis. While in the hospital a severe neuritis, so called, developed in the right shoulder and arm, which proved to be extremely incapacitating and persistent during the following three months of rest at home. Within this period a similar condition arose in the left upper extremity. Two abscessed teeth, thought to be the source of the trouble, had been extracted during this time. Hot applications seemed to give some relief. The patient was unable to raise his arm and the severity of the pain was so marked that use of the upper extremities was practically impossible. Clinical examination showed marked atrophy about both shoulders, particularly about the right; there was extreme limitation of abduction and internal and external rotation of the right shoulder, with relatively free extension and flexion. There was also a limitation of extension of the right elbow; the wrist joint was free from any abnormality. The metacarpophalangeal and interphalangeal joints of the right hand showed marked periarticular soft tissue thickening with extreme limitation of movement associated with pain. There were no motor or sensory disturbances, and the reflexes were normal. A similar process, less severe in degree, involved the corresponding joints in the left upper extremity. The cervical spine did not show pathologic changes. The remaining joints of the body were free from abnormality. Nose and throat examination did not demonstrate a focus. Dental rentgenograms showed that any teeth which had been infected had been removed. On readmission, compound solution of iodine and digitalis were resumed. X-ray examination of the right shoulder showed some apparent thickening in the region of the subdeltoid bursa. The Wassermann and Kahn reactions were negative. Blood counts, chemistry of the blood and urinalysis were all within normal limits. Increased elimination from the bowel was secured, and diathermy was given him through the affected joints. Frequent soakings of the hands in hot solution were adopted; there was absolute avoidance of manipulation. Salicylates and related products were of little avail in relieving the symptoms. Three weeks following admission complete thyroidectomy was performed, the wound being left open for twenty-four hours and then being closed. Section of tissue showed an adenomatous goiter. The patient was discharged on the fifth day after operation. The striking features in the patient's condition were the persistent and progressive periarticular changes involving the joints noted, which completely failed to respond to any of the recognized physical measures and forms of medication up to the time the thyroidectomy was performed. Within from forty-eight to seventy-two hours following operation the severity of the pain in the extremities had lessened almost miraculously. Three weeks following his discharge he wrote that the arthritis in his right hand and shoulder was gradually giving way; no sedatives had been required since his discharge; there was yet considerable stiffness in the shoulder joint and in the right hand, but he felt confident that this would gradually disappear. So far he had not taken treatment. From his experience he was clearly convinced that there was a close relationship between the goiter and the arthritis as it appeared in his case, and he knew that the removal of the goiter had distinctly benefited his hand and shoulders.

Ten days later he stated that he was getting better use of the right hand. The shoulders were improving. They were somewhat stiff, but he was now able to dress himself with the exception of putting on his overcoat.

Within six weeks following this his left shoulder was wholly normal; he had some stiffness in the right shoulder and hand.

Six months following this he wrote that there was some stiffness of his right forearm and knuckles, but that his shoulders were completely normal. In a recent letter he reported that he was in better condition than for several years, and that he felt like a new man.

CASE 2.—A woman, white, aged 62, who had been living in India for a number of years, presented herself for examination in January, 1928, with a history that one and a half years prior to that time under the stress of increased work she broke down. She had symptoms of nervousness and weakness and lack of vitality; she noticed that her heart beat rapidly and there had been some swelling of her feet and ankles; she had had some enlargement of the thyroid gland for several years, but with the onset of these symptoms the gland had become larger. She had had a severe attack of diarrhea while in India, and a diagnosis of cholera had been made. During this illness she had lost 65 pounds (29.5 Kg.). She had never had joint troubles until the goiter became active a year or a year and a half prior to examination. Both shoulders, the right elbow and the left knee were mainly affected, although the right knee was involved as well. All the teeth had been removed; she gave an absolutely negative nose and throat history and her bowel movements were perfectly regular. The thyroid gland was the size of an orange, hard, and with a small adenoma in the midline. Examination of the joints showed a very marked degree of restriction of abduction and of internal and external rotation in both shoulders. No pathologic condition was demonstrable in the elbows; anteroposterior movement in both shoulders was good; both knees were held flexed at an angle of 30 degrees; there was marked atrophy of contiguous soft structures and marked spasm of the hamstrings. There was no evidence of excessive fluid in any of the affected joints. The basal metabolic rate was plus 66 per cent. Other physical observations confirmed the fact that she was suffering from a severe hyperthyroidism. X-ray examination of the right shoulder showed some calcific infiltration in the region of the subdeltoid bursa. X-ray examination of the left knee showed moderate hypertrophic changes about this joint, most marked about the patella. Repeated urinalyses did not reveal gross abnormality. The blood Wassermann test, chemical examination of the blood and blood counts did not show a variation from normal. There was no focus of infection in the nose and throat. The patient was hospitalized and put on a preoperative routine, compound solution of iron and digitalis, absolute rest for the affected extremities with heat applied to all the affected joints and hot soaks for the hands, along with diathermy to both shoulders. Ligations were done on the seventh and twentieth days, with slight benefit; lobectomy was done on the thirtieth day of hospitalization, and closure on the following day. There was a very severe reaction, and transfusion was done on the thirty-sixth day. The patient was discharged on the forty-second day following admission. Five weeks following discharge, pains in the shoulders and hands had gone, and pains in the knees and elbows had gone; she sits nearly all day in a wheelchair and reads; she is happy to report steady improvement. It is to be noted particularly that the severe joint pains were markedly relieved within two days. More recent reports show continued improvement in all joints in which abnormality was manifested.

COMMENT

I present these case histories to bring out more distinctly than I can in any other way the classic statements and the typical clinical course of these patients. This type of true articular or periarticular change is a definite entity and would unquestionably appear to be the result of the disturbed secretion of the hyperactive thyroid gland. Whether or not the thyroid gland itself is the prime factor in the production of these cases one cannot

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state positively, although it seems most logical that this is another manifestation of a condition that is comparable to a toxemia which gives rise to such widespread changes throughout the body. Of this group of cases observed by us, 64 per cent were females, a fact which accords with the experience of other persons particularly interested in an analysis of the so-called endocrine arthritides. This preponderance can readily be due to the unquestioned prevalence of hyperthryoid disease among women.

A review of the ages shows that 6 per cent of the patients have had joint involvement between the ages of 20 and 30; none of the cases were of the protracted type of joint trouble, and I feel that, the younger the patient, the less frequently the complication arises and the less marked the joint reaction. It seems that hip joints have been the sites of election in these younger patients, with rapid improvement and distinct disappearance of symptoms. Twelve per cent occurred between the ages of 30 and 40; 60 per cent were found to be present between the ages of 40 and 60; and two thirds of this group occurred between the ages of 50 and 60, showing a tremendous preponderance in this decade. In the sixth decade 22 per cent of these cases were placed. This would appear to be a very significant fact, particularly in view of the belief that the average age of the patients admitted with hyperthyroidism lies between 25 and 45.

In regard to the influence of the menstrual function in these cases, it may be noted that the majority of the patients had passed the menopause. In only one instance among the remaining patients is there a record of any disturbance of ovarian function. This was manifested by a metrorrhagia.

Basal metabolic rates varying from plus 22 to plus 88 per cent were observed, and all these patients evidenced marked symptoms of hyperthyroidism. It was noteworthy in these cases that the first signs of disease of the joints appeared at the time the hyperthyroidism was at its height and that the severity and extent of the joint involvement appeared to be in direct proportion to the severity of the hyperthyroidism. More than 80 per cent showed the earliest manifestation to be in the shoulders, and of this group over half had bilateral involvement. I cannot agree with other observers that in this particular form of endocrine disease the joint changes are always symmetrical.

Next in order of frequency of involvement were noted the knees; the metacarpophalangeal and interphalangeal joints of the hands were almost as frequently affected; next the feet and lumbar spine, and hip joints in order of frequency. In approximately half of these cases the joint involvement was multiple, with almost invariably the onset occurring in the shoulders with rapid or gradual involvement of other articulations. It was never associated with febrile reaction or any local signs of effusion, redness or acute inflammation. Invariably, if the hands became affected, the shoulder involvement on the same side preceded this state; the toe joints have never been found to be affected. There was little tendency toward remission; the process is progressive with a high degree of limitation of movement.

From the beginning the subjective difficulties are marked; there is a distinct predilection for localization about the shoulders as noted, and clinically these patients present a typical picture of a toxic periarthritis. Why the shoulder should be affected more frequently than any other joint is somewhat difficult to explain, although the pure anatomic features are sufficient to make even a simple inflammation in this region unlikely to exist as an uncomplicated condition.

With reference to the distinction between true intra-articular and periarticular involvement, it would appear that change about all these joints is chiefly periarticular in character; most assuredly is that about the shoulders, with typical restriction of abduction, internal and external rotation and the relatively free anteroposterior movement. The thickened capsules of the finger joints and the metacarpophalangeal joints with the almost invariable freedom of wrists and elbows and the marked lessening of joint function caused by pain on movement are common observations. Radiologically I have been unable to demonstrate any gross bone or joint changes apart from atrophy, except in some instances in which a thickening of the subdeltoid bursa has been apparent. Roentgenograms of the hands show swelling of the periarticular soft parts of the fingers. An existent arthritis appears to be aggravated markedly during the course of a severe hyperthyroidism and recedes markedly with the institution of radical treatment of the hyperactive goiter. I have not observed subluxations or persistent joint deformities in this group which I describe, and whether or not the destructive processes will follow can be determined only by subsequent observation.

The degree of joint change is dependent on the severity of the hyperthyroidism and the duration of the disability prior to the institution of radical treatment. In other words, the chronicity and the severity of the periarticular change will determine the rapidity of recovery. I have attempted to determine the type of gland occurring in these cases: Two thirds showed a diffuse hyperplasia; the remainder, adenomas. In 20 per cent of these cases infected tonsils were present, and in an equal number, infected teeth. Other cases had the history of marked intestinal stasis. Obviously, no attempt was made to remove any focus in the course of the acute disease. The onset of the joint condition appeared to coincide with the height of the thyroid disease, even mild trauma in two instances acting as an inducing agent. However, experience shows that in the majority of cases these joint symptoms developed in patients in bed in a condition as close to absolute rest as was practical. The onset was in each case fairly typical, as manifested in the cases outlined. Urinalyses did not reveal a departure from normal, nor did the chemical examination of the blood. The Wassermann and Kahn reactions in each case were negative; in fact, none of the ordinary laboratory procedures revealed anything of helpful significance.

TREATMENT

None of these cases have been treated with the x-rays. Each one has been approached from an operative point of view. Curschmann[2] reports a cure of associated hyperthyroidism and joint lesions following irradiation. In no one of our cases have glandular extracts been adopted. The treatment in the preoperative stage has proved to be a disappointing experience. Despite complete rest in bed, local applications to the affected parts, heat in every form, including diathermy and infra-red irradiation, and despite the use of salicylates, cinchophen and related compounds, these patients have failed to manifest anything other than very mild improvement, except those younger ones of whom I have spoken before, who have responded fairly satisfactorily to the

2. Curschmann, H.: Severe Gastric Disturbances and Joint Diseases in Toxic Goiter, Deutsche Ztschr. f. Chir. **192**: 13-27, 1925.

ordinary preoperative routine, which has included compound solution of iodine. Diathermy to the affected joints has proved to be the most effectual form of physical therapy that has been available.

After a thyroidectomy almost invariably there is an extremely marked degree of improvement from within at least forty-eight to seventy-two hours following operation. The question comes up as to whether or not this could be attributed to the quantity of sedatives which the patient has had in those first two or three days. This does not seem to be a logical explanation, since similar sedatives, perhaps in smaller quantity, have failed in any way to be effective prior to surgical intervention. From this time on there is a gradual progression toward complete recovery, as has been outlined in the case reports. The most striking phenomenon is the rapid subsiding of the intense joint pain. Ligations have given little if any improvement. A single lobectomy in the majority of instances has been ineffectual. Logically some stiffness persists since this appears to be definitely due to a fibrotic process in the periarticular structures and consequently there can only be a gradual resolution of such a tissue change. A point in favor of the theory that this is a capsular and periarticular manifestation is the complete return to normal of the joints with a disappearance of the atrophy and trophic disturbances. The length of the convalescent period appears to be definitely related to the duration of this change and the severity of it prior to the thyroidectomy.

When the more acute manifestations have subsided, gradual stretching of the joints and the application of heat in any form, particularly diathermy to the affected parts, have been found to be helpful in restoring the function of the affected joints. Moreover, it is also a fact that despite any form of treatment, these patients go on to a complete functional and anatomic recovery.

Is it not logical to surmise that such individuals as I have described have been suffering from an articular or periarticular condition that is the result of a toxin arising from the hyperactive thyroid gland? It does not appear that this type of change can be neuritis. Is this condition due to the thyroid secretion itself, or may it be related to the accompanying focus of infection, as I have demonstrated in at least 40 per cent of these cases? It seems rather illogical to believe that this is the case when such manifest improvement is demonstrated following thyroidectomy. The theory that this form of chronic disease of the joints is dependent on a dysfunction of the thyroid seems to me to be supported not only by such experiences as mine but by the repeated descriptions of the beneficial thyroid preparations in cases not manifesting acute hyperthyroidism. I have yet to see a patient suffering from this typical disorder who was not relieved by thyroidectomy. In no instance was manipulation adopted.

Numerous theories have been offered with reference to the production of these joint changes associated with endocrine disturbances. One of the chief factors appears to be a disturbance of the apparatus controlling the glands of inner secretion, particularly in the direction of an increased sensibility of the sympathetic system. In women this may be occasioned by the lack of ovarian function and a consequent disorder of the sympatheticus, or by the increase in the activity of the thyroid gland, thus exciting the sympatheticus. On account of the distribution among men and women the thyroid factor, particularly in this group, seems to be the most plausible explanation. It is altogether probable, as certain writers suggest, not only that the thyroid gland is involved but that a combined disturbance of all the glands of internal secretion is present in these cases.

It would appear to be that this connection between hyperthyroidism and disease of the joints has much of practical and therapeutic significance attached to it. In these cases, as Curschmann notes, there is the possibility of carrying out therapy directed against the cause in cases of thyrogenous joint disease. Obviously this is one type of endocrine disturbance which if treated either by roentgen ray or by thyroidectomy goes on to a virtual cure, and much more is accomplished by these two procedures than by all other means combined. As I mentioned previously, a careful and painstaking history will reveal a more frequent incidence of hyperthyroidism associated with lesions of the joints than one might imagine, and consequently, I feel that if the diagnosis is made before the joint manifestations have extended over a protracted period, many of these patients will be saved from a state of chronic invalidism.

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ABSTRACT OF DISCUSSION

DR. EARL ELSE, Portland, Ore.: A neuritis also accompanies hyperthyroidism. I want to discuss this from the standpoint of one dealing with the thyroid and not one dealing with joint conditions. Failure to recognize it means that many patients go on for a long time and are treated in various ways without results. I saw a patient who, for about one year, had had sacro-iliac joint pain. He was walking with a cane. He had been treated at one time by three months' rest in bed, and various physical therapy measures had been tried. The man went to the hospital with his cane for partial thyroidectomy and left the hospital in seven days without his cane. He was a farmer, and in a month's time he was back at work. He has had no difficulty since then. There can be no question about the direct relationship. Formerly we looked on these things as being coincidental, but they must be directly related. As I said, neuritis is also associated with hyperthyroidism, which yields almost immediately on operation, showing that there is a connection. I cannot explain how it occurs. We have never seen a death in one of these patients, so there has not been an opportunity to study the nerves or joints. The pain overshadows the hyperthyroidism in some of the patients I have seen. Every case I have seen has been in patients with adenomatous goiter. I have never seen one associated with the exophthalmic type of goiter.

Bernard Shaw and Vaccination.—One finds otherwise illustrious men, for instance, Bernard Shaw, ignorantly prating about the efficacy or rather the inefficacy of vaccination. In the preface to the Doctor's Dilemma Shaw has the temerity to say: "Such monstrosities as vaccination are, as we have seen, founded not on science but on half crowns. If the Vaccination Acts . . . were strengthened by compelling every parent to have his child vaccinated by a public officer, whose salary was completely independent of the number of vaccinations performed by him . . . vaccination would be dead in two years, as the vaccinator would not only not gain by it but would lose credit through the depressing effects on vital statistics of his district of the illness and death it causes, whilst it would take from him all the credit of that freedom from smallpox which is the result of good sanitary administration and vigilant prevention of infection." This profound ignorance of the subject on the part of one of the best dramatists of the day is incredible. If he meant these statements as entertaining irony then he trifles with human life. If he meant them seriously one must gasp at his self-sufficient audacity. Shaw is a brilliant philosophic satirist but a lamentably bad and, moreover a dangerous, sanitarian. His words are perhaps best to be interpreted as a manifestation of his rebellious spirit against all existing institutions.—Schamberg and Kolmer: Acute Infectious Diseases.

"ACUTE INDIGESTION" IN RELATION TO CORONARY THROMBOSIS *

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The term "acute indigestion" is an example of the indefinite and inaccurate medical nomenclature not infrequently appearing in the public print. Sudden collapse with acute abdominal pain, nausea and vomiting may occur with acute coronary obstruction, but the underlying pathologic condition may be masked by the severity and predominance of abdominal symptoms. Not infrequently precordial and ordinary anginal pain is entirely absent. In such instances one is confronted with the possibility of acute surgical conditions in the abdomen. In recent years surgeons [1] have called attention to "the acute abdomen" but have neglected to stress the possibility of acute obstruction of the coronary arteries causing abdominal symptoms which may be identical with intra-abdominal emergencies. Others [2] have noted acute abdominal symptoms in relation to thoracic disease but have not referred to coronary thrombosis. On the other hand, writers on acute coronary obstruction have noted the difficulty often presented in deciding whether the acute abdominal symptoms may be due to the cardiac condition or to an intra-abdominal one.

In a little more than a decade and a half, acute coronary obstruction, usually due to thrombosis, has become known as a clinical entity. In reviewing the literature one becomes somewhat confused because of the terminology: some writers speak of coronary occlusion and obstruction synonymously while others appear to make a distinction between them; the term coronary sclerosis is used by others to indicate the lesion probably present because of peripheral arteriosclerosis, associated with cases without acute attacks of anginal pain as contrasted with acute attacks due to coronary thrombosis. Then again there are papers on cardiac infarction as a clinical entity due to acute closure, and associated with pericardial friction rub, fever and leukocytosis. Cardiac aneurysm and rupture resulting from coronary closure and infarction are reported with increasing frequency. This increasing literature has also obscured the term angina pectoris, but the old controversy for or against coronary disease as the underlying pathologic condition has gradually subsided since the papers of Huchard,[3] Osler [4] and Herrick,[5] though reopened by Allbutt [6] in 1915. Now, it seems generally conceded that angina pectoris implies coronary artery disease, and that this disease may be sclerosis, with resultant narrowing, which may be gradual and attended by mild and occasional pain, or sudden pain due to thrombosis. Benson's [7] experience in making coronal sections of the artery and uniformly finding thrombi which are overlooked in slitting the artery suggests that there are really few cases which do not show coronary artery disease. It has been suggested that the term angina is the symptom and that the pathologic condition varies as described.

The salient features of acute coronary occlusion include: (1) sudden severe anginoid pain, substernal or upper abdominal (in our series thirty-four patients, or 83 per cent, had acute abdominal pain); (2) pinched, ashen gray or very pale facies often associated with a feeling of impending death; (3) acute emphysematous distention of the lungs with dyspnea or orthopnea and moist crackling râles at the bases of the lungs, together with the onset of acute heart failure; (4) an early thready compressible pulse which may present almost any form of arrhythmia; (5) sudden drop in systolic pressure following the severe pain associated with myocardial exhaustion; (6) a cardiac impulse which, if felt at all, is a diffuse feeble tap; (7) distant heart sounds and often a gallop rhythm; (8) a localized pericardial friction rub which is evanescent, appearing within a few hours or a day or two after the sudden onset; (9) a fever of short duration and of mild type, associated with leukocytosis (this does not appear in simple angina pectoris), and (10) inversion or iso-electric position of the T wave and sometimes evidence of intraventricular block in the electrocardiogram.[8]

As has been stated, some authors have previously recognized the difficulty arising in diagnosis between coronary thrombosis and the so-called acute abdomen. Gardinier,[8] Wearn,[9] Acker,[10] Kerr, Larkey and Larsen,[11] Hamman,[8] McNee [12] and Hardt [13] have called attention to the coronary occlusion which has simulated acute conditions of the abdomen. Faulkner, Marble and White,[14] and Willius and Brown,[15] refer to the differential diagnosis of acute coronary occlusion and cholelithiasis, or the coincidence of both diseases. Osler,[4] in 1910, spoke of cases of acute abdominal symptoms like gallstone colic which he called angina abdominis. To Herrick [5] is due the credit for first calling attention to the importance of these abdominal symptoms, as he emphasized the similarity of this picture to the one ordinarily thought of in such abdominal conditions as acute gallbladder disease, acute hemorrhagic pancreatitis, perforated gastric or duodenal

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1. John B. Deaver (The Acute Abdomen, Surg. Gynec. Obst. **39:** 744 [Dec.] 1924) and others have called attention to the difficulty of diagnosis of acute abdominal conditions, mentioning incipient pneumonia but not referring to acute coronary closure (usually thrombosis). In order of frequency Deaver gives appendicitis, cholecystitis, perforated duodenal or gastric ulcer, acute salpingitis, acute intestinal obstruction, ruptured extrauterine pregnancy, acute pancreatitis, acute hematogenous infection of the kidney, twisted pedicle of ovarian cyst, acute diverticulitis and mesenteric thrombosis.

2. Zachary Cope (The Differential Diagnosis Between Acute Thoracic and Abdominal Disease, Brit. M. J. **1:** 700 [April] 1924) does not refer to acute coronary occlusion. One of Holden's patients was a middle aged man in whom acute coronary occlusion may have been present. (Holden, W. B.: Report of Three Cases of Pericarditis in Which the Symptoms Were Entirely Referred to the Abdominal Cavity, Northwest Med. **19:** 230 [Sept.] 1920).

3. Huchard: Traité des maladies du cœur, Paris, Octave Doin, 1905.

4. Osler, William: Angina Pectoris and Allied States, New York, D. Appleton & Co., 1901; Angina Pectoris: Lumleian Lectures, Lancet **1:** 697, 839, 975, 1910.

5. Herrick, J. B.: Clinical Features of Sudden Obstruction of the Coronary Arteries, J. A. M. A. **59:** 2015 (Dec. 7) 1912.

6. Allbutt, Clifford: Diseases of the Arteries Including Angina Pectoris, London, MacMillan Company, 1915.

7. Benson, R. L.: The Present Status of Coronary Arterial Disease, Arch. Path. & Lab. Med. **2:** 876 (Dec.) 1926. (Benson gives a very complete bibliography, discussing the subject from the standpoint of pathology, including acute occlusion with infarct, aneurysm or cardiac rupture.)

8. Gardinier, H. C.: Coronary Arterial Occlusion: A Perfectly Definite Complex: Report of Thirteen Cases with One Autopsy, Am. J. M. Sc. **168:** 181 (Aug.) 1924. Hamman, Louis: The Symptoms of Coronary Occlusion, Bull. Johns Hopkins Hosp. **39:** 273 (April) 1926. (Hamman gives a complete bibliography.)

9. Wearn, J. T.: Thrombosis of Coronary Arteries with Infarction of the Heart, Am. J. M. Sc. **165:** 250 (Feb.) 1923.

10. Acker, R. B.: Delayed Death in Coronary Thrombosis, J. A. M. A. **73:** 1692 (Nov. 29) 1919.

11. Kerr, W. J.; Larkey, W. V., and Larsen, A. E.: Coronary Occlusion and Myocardial Degeneration, California & West. Med. **23:** 46 (Jan.) 1925.

12. J. W. McNee (Thrombosis of the Coronary Arteries, Quart. J. Med. **19:** 44 [Oct.] 1925) comments on the fact that in Great Britain little has been written until recently, while in America there has been an increasing literature since about 1910.

13. Hardt, L. L.: Coronary Thrombosis Simulating Perforated Peptic Ulcer, J. A. M. A. **82:** 692 (March 1) 1924.

14. Faulkner, J. M.; Marble H. C., and White, P. D.: Differential Diagnosis of Coronary Occlusion and Cholelithiasis, J. A. M. A. **83:** 2080 (Dec. 27) 1924.

15. Willius, F. A., and Brown, G. E.: Coronary Sclerosis: An Analysis of Eighty-Six Necropsies, Am. J. M. Sc. **168:** 165 (Aug.) 1924.

ulcer, or hemorrhage into the suprarenal capsule. The site of pain may vary greatly.[16]

In studying a group of cases of angina pectoris we have been struck with the frequency of acute abdominal symptoms, often called "acute indigestion," and particularly their relation to acute coronary occlusion usually due to thrombosis. Of 192 cases of angina pectoris, seventy-two can be grouped as due to acute coronary obstruction. Of these there are thirty-four in which acute abdominal symptoms predominated in all of which thrombosis is considered as the etiologic factor for the reasons just stated. For convenience the

TABLE 1.—*Incidence of Nonacute and Acute Coronary Disease in One Hundred and Ninety-Two Cases of "Angina" and Significant Electrocardiographic Changes*

	Number	%	Electrocardiogram Taken	Electrocardiographic Signs and Changes	%
1. Anginal cases	192	100	167	154	92
A. Coronary obstruction not acute (coronary sclerosis)	120	63	110	103	93
B. Acute coronary occlusion (thrombosis)	41	21	37	34	92
C. Acute coronary occlusion (diagnosis from history)	31	16	20	17	85
Acute coronary occlusion	...	...	...	...	..
Total	72	37	57	51	89

cases presenting acute symptoms were grouped as follows: (1) coronary thrombosis with acute abdominal symptoms alone; (2) coronary thrombosis with acute abdominal symptoms associated with precordial pain suggesting or typical of angina pectoris; (3) coronary thrombosis with angina and without abdominal symptoms. The following is a summary of typically characteristic cases:

REPORT OF CASES

CASE 1.—*Acute abdominal pain in acute coronary thrombosis suggestive of cholelithiasis, in 1917; recovery.*

J. L. M., a man, aged 55, seen in 1917 in consultation because of acute abdominal pain, had had an oppression for ten days before which began in the epigastrium and extended up to the lower sternum. Two days before he had had nausea which now seemed related to exertion or eating. The condition suggested cholecystitis, but moderate tachycardia, a temperature of 99 F. and distant heart sounds with the history of oppression in the chest led to the diagnosis of angina. We did not then consider coronary thrombosis. The patient gradually recovered and is well today, though for some time after his acute illness he had precordial pain on effort. Electrocardiograms showed suggestive changes.

CASE 2.—*Acute abdominal pain with shock in acute coronary thrombosis with cardiac signs and symptoms occurring days later.*

A. L. U., a man, aged 60, seen, Nov. 1, 1920, had had acute epigastric pain with nausea and vomiting which had confined him to bed for ten days. Dyspnea had gradually developed. He recovered so as to be up and about but the epigastric pain and dyspnea were brought on by effort, so that he had to stop after walking one-half block; precordial pain gradually came on. On examination the pulse was 56 and regular, and the blood pressure 150 systolic and 90 diastolic. The heart borders were slightly increased to the left. There was a soft systolic murmur at the apex but the heart sounds were distant.

CASE 3.—*Acute abdominal symptoms associated with chest pain in acute coronary occlusion with repeated attacks. Necropsy.*

E., a man, aged 63, had had an attack of heart pain in 1918 while walking up a hill. It was knifelike and he collapsed. On recovery he had occasional precordial pain on effort, with dyspnea. He was seen first on Dec. 24, 1926, when he said that for two years he had had increasing pain. The heart was enlarged but compensating. Early in 1927 he had a severe attack of heart pain, nausea, vomiting and collapse followed by fever. He was in bed ten days. Similar attacks occurred also on Sept. 20, 1927, and April 30, 1928. He died during a severe attack in May, 1928. Necropsy showed marked sclerosis of the coronary arteries with marked narrowing of the lumen. There were recanalized thrombi in the circumflex arteries with reocclusion of the right by a fresh red thrombus.

CASE 4.—*A typical case of acute coronary occlusion without abdominal manifestations.*

C. H., a man, aged 47, had had his first heart pain while walking up a hill two years before examination; the attack was severe but he recovered. Early in October, 1927, he had a severe attack while playing golf, which ended when he stopped. October 6, on getting out of bed, he had another very severe attack radiating to both arms. October 22, he had another very severe attack followed by a temperature of 102 F. and a leukocytosis of 26,000. Electrocardiograms, Oct. 14, 1927, showed inverted T waves in leads I and II, though in May, 1927, they were normal. There has been gradual recovery.

CASE 5.—*A chronic case of coronary occlusion without acute symptoms yet showing, at necropsy, old thrombosis with recanalization.*

M., a man, aged 62, when seen, Feb. 8, 1926, said that he had had precordial pain on effort for four or five years but that it had been worse during the past few weeks. After exertion or after eating heartily he had on several occasions suffered from severe pain in the midsternal region. He was lost sight of but died in his automobile, Nov. 16, 1927. Necropsy showed marked sclerosis of the coronaries with occlusion of the right branch by an old canalized thrombus. The aorta was sclerotic and there was slight myofibrosis in the posterior wall of the left ventricle, an area supplied by branches of the right coronary.

TABLE 2.—*Acute Coronary Occlusion Showing Abdominal Symptoms Only, Abdominal Symptoms Associated With Precordial (Anginal) Pain, and Without Abdominal Symptoms*

Group	Number of Cases
Acute coronary occlusion (thrombosis)	72
1. Patients seen during attacks	41
A. Abdominal symptoms only	15
B. Abdominal symptoms with heart symptoms	19
C. Without abdominal symptoms	8
2. Patients seen after attacks, diagnosed from history	31

CASE 6.—*Acute coronary occlusion with chest symptoms, failing heart and a second acute coronary attack. Necropsy.*

C. B. W., a man, aged 64, was ill in bed in January, February and March, 1925, with congestive heart failure. A year before he had been acutely ill with severe epigastric and substernal pain, nausea and vomiting, at which time he was in bed for ten days. Since then he had had precordial pain radiating to the left arm, on exertion, often burning in character. In September, when he was first seen, there was moderate heart failure. Electrocardiograms showed right bundle branch block. Oct. 14, 1925, he was awakened by very severe pain in the heart region; he was wet with perspiration and feared that he would die. He coughed up clots of blood. He died, December 24. Necropsy showed infarction in both lungs, thrombi in the left coronary artery, and a branch at the apex. There were also infarcts in the kidney.

CASE 7.—*A mild anginal attack with later acute collapse and acute abdominal symptoms. Necropsy.*

L. C. M., a man, aged 61, seen, April 30, 1924, had had a feeling of pressure in the precordium since tonsillectomy, two weeks before. He was well until December 23, when he had an acute collapse. Necropsy revealed an old occlusion of the left anterior coronary arteries by an organized and recanalized

16. Willius, F. A.: A Typical Pain with Angina Pectoris, M. Clin. North America **5**: 371 (Sept.) 1921.

thrombus. A slight myofibrosis of the left ventricular wall was noted. Death was caused by a spontaneous rupture of the ascending aorta.

COMMENT

Although Osler recognized the abdominal picture in many cases of angina pectoris and Herrick elucidated acute coronary occlusion, the medical profession as a whole has apparently ignored the importance of these abdominal signs and symptoms in coronary syndromes. In our series we were rather astonished to find that there were more of the acute cases showing abdominal manifestations than any other sign, except chest pain, leukocytosis and fever. The cases that we were privileged to see during the acute attack numbered forty-one, being 23 per cent of the total number in this series. In thirty-four, or 17 per cent, there were distinct morbid conditions of the abdomen. There were eight of these who presented the picture of an acute condition of the abdomen and surgery was avoided only because of a painstaking cardiac examination. While many practitioners, whose interest is purely medical, have called attention to this diagnostic problem, the latest textbooks on surgery and "the acute abdomen" seem not to mention acute coronary occlusion as one of the possible etiologic factors.

In the tables we draw attention to the number of patients who showed leukocytosis and fever. While this number is very low, it is 100 per cent for those cases in which the data were available. Another factor which is not new but which seemed to us to be present

TABLE 3.—*Incidence of Chief Signs and Symptoms in Coronary Disease*

Sign or Symptom	Coronary Obstruction (Chronic)	Acute Coronary Occlusion Cases Studied in Attack	Acute Coronary Occlusion Diagnosed from History
Shock	0	29	1
Abdominal pain	22	27	4
Nausea and vomiting	5	29	7
Gas and bloating	31	34	8
Acute surgical condition of abdomen	0	8	0
Chest pain	120	26	31
Signs of heart failure	49	36	14
Leukocytosis	0	Only 14 counted 14	0
Fever	0	Only temperature records in 32	8
Evidence of arteriosclerosis	96	40	19
Prodromal signs or symptoms	...	25	6
Total number of cases	120	41	31

in a greater percentage than might be expected was the evidence of peripheral arteriosclerosis, this being found in 87 per cent of all cases.

Attention is also called to the number of patients who complained of angina and attributed this trouble to an attack of influenza. Inquiry so often has brought forth a picture characterized by elevation of temperature, indigestion, abdominal pain, and shock that we have the impression that many of these were definite acute coronary occlusions and that thirty-one cases, or 16 per cent of our series, showed this phenomenon.

While complete electrocardiographic figures and a consideration of abnormalities have been avoided in this discussion, it should be of interest to note the great number who showed abnormalities. In this series 89 per cent of all patients in whom electrocardiograms were taken showed changes. In the group with acute coronary occlusion the number showing changes was 92 per cent and in those with chronic coronary occlusion it was 93 per cent. In those patients in whom an acute coronary occlusion had been diagnosed from the history, the incidence was only 85 per cent, which lowered the figure for the series and is probably due to error in diagnosis. We think that the electrocardiogram is a valuable asset and somewhat of a proof in the diagnosis.

Many authors have spoken of the prodromal symptoms so often noted before acute coronary occlusion. In our series there were only twenty-five of the forty-one acute cases in which these symptoms were exhibited.

While complete data are lacking concerning focal infections, we are struck with the frequency with which such infections are obvious in many of these cases.

The prognosis in acute coronary occlusion is always regarded as grave; yet in this series many have recovered, some are still living after a five year period, and one who had his attack eleven years ago still follows his daily occupation.

CONCLUSIONS

Acute coronary occlusion (thrombosis) is often associated with or is the cause of abdominal signs and symptoms, and occasionally it will simulate an acute surgical condition of the abdomen. Frequently these cases are diagnosed as acute indigestion, and the underlying pathologic condition is entirely overlooked.

ABSTRACT OF DISCUSSION

DR. S. MARX WHITE, Minneapolis: The authors are doing a service in calling attention to coronary thrombosis, because of the growing certainty with which we can recognize the nature of a cardiac disturbance with this group of symptoms. Certain of these symptoms manifest themselves under conditions of abdominal involvement, such as fever and leukocytosis, and these have only a relative value in distinguishing coronary thrombosis but are nevertheless of some help. When we come, however, to a careful study of the cardiovascular symptoms, the values begin to rise. Blood pressure changes are not particularly distinctive, as certain of the abdominal conditions will manifest blood pressure changes. In hypertension, the fall may be due only to low normal values. The authors have properly stressed the study of the circulation, particularly the pulmonary. In the general examination, of most importance is a very frequent and painstaking examination of the precordia for signs of pericardial friction rub. I have been rewarded in a number of instances for such examination daily or oftener, because the friction rub is sometimes surprisingly evanescent, being found only in one or two examinations and then promptly disappearing. Although the authors, probably because they wished to emphasize the other phases, have passed rather lightly over the electrocardiographic examination, it seems to me that this is most important as shown by the very large incidence of changes in the electrocardiogram. That is often not thought of, because the pulse may be perfectly regular, but the method should not be neglected. A very great percentage of these patients show electrocardiographic changes. One who is concerned in consultation work has particular opportunity for the use of the portable electrocardiograph, because the condition or situation of the patient may make transportation to the cardiac station objectionable, or he may be in a small institution where the electrocardiograph is not available. The general examination, however, is of extraordinary value, and it must be stressed that acute abdominal pain with collapse and all of the phenomena shown requires immediate, careful and painstaking study, for the possibility of coronary thrombosis. Under the circumstances, the electrocardiograph is of extraordinary value.

DR. GEORGE D. HEAD, Minneapolis: Curiously enough, in the first account that was given of the symptoms of coronary occlusion by the Russian physicians Objatzow and Strachesko, stress was laid on the acute abdominal symptoms. They stressed, for example, first, the severe prolonged pain; second, the extreme dyspnea or orthopnea, and third, the severe epigastric pain. This was in 1910. So impressed were these observers with this feature that they gave a special name to

the abdominal pain, the status gastralgicus. Hardly a writer following these observers has failed to stress the abdominal pain present in the disease and to warn against the misinterpretation of it. Puzzlingly enough, associated with the pain there is often tenderness, rigidity of the abdominal muscles, distention, nausea and vomiting, and sometimes even jaundice. How can one avoid the confusion that arises in the interpretation of the abdominal pain due to coronary occlusion, and that due to intra-abdominal disease, such as gallstone colic, ruptured gastric ulcer and acute pancreatitis? In a considerable personal experience with these conditions extending over years, the most puzzling to me has been the gallstone colic. I should like to stress the following points: The most important is that the possibility of coronary occlusion in any attack of severe pain occurring suddenly in the upper abdomen and lower chest must be considered. Second, one should listen carefully to the history of the attack as given by the patient, and to the prior history, because often it will give an inkling of the nature of the attack from the milder forms of angina which the patient will describe frequently associated with shortness of breath. Third, coronary occlusion is not common before the age of 50. Fourth, coronary occlusion is found more often in men, and gallstone attacks occur more frequently in women. Fifth, there is usually a feeling of chest constriction in this disease that is not seen in various abdominal conditions. Sixth, the feeble heart sounds and altered cardiac rhythm usually present must be evaluated properly.

DR. T. HOMER COFFEN, Portland, Ore.: We did not stress the electrocardiographic results more because this paper dealt entirely with the differential diagnosis of acute coronary obstruction in regard to abdominal symptoms. One thing that is important in regard to the treatment of these patients is a long continued period of rest after the occlusion has occurred, because in a few instances patients have been allowed to get up and about in too short a time and sudden death has occurred.

SERUM PROPHYLAXIS IN A MEASLES EPIDEMIC *

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Renewed interest in the problems connected with measles has been steadily increasing in the last ten years. It may be said to have begun with the inconspicuous publication by Nicolle and Conseil [1] in 1918. In the last five or six years particularly there have appeared numerous reports on the results of treatment with convalescent serum and many studies dealing with researches on the etiology and on the production of prophylactic and therapeutic serums. At the same time, epidemiologists have been pointing out that the general measures used in the effort to control epidemic diseases have been of little avail in measles, and they have emphasized the need of administrative methods based on exact knowledge of the natural history of the disease.[2]

REVIEW OF RECENT WORK ON MEASLES

Smallpox and diphtheria are the best examples of control by vaccination and active immunization. Similar methods have recently been attempted for measles. Caronia's work with vaccines is reviewed by McCartney [3] and by Redlich,[4] who conclude that his claims have not been proved. Since Hektoen [5] established the fact that the etiologic agent of measles is present in the blood at the beginning of the rash, Hiraishi and Okamoto [6] endeavored to produce immunity by injecting tiny quantities of diluted blood taken from a patient in the catarrhal stage. Debré and his co-workers [7] have recently tried out two injections of diluted measles blood giving $\frac{1}{800}$ cc. as the first dose and $\frac{1}{400}$ cc. as the second dose after an interval of three weeks. This means for producing active immunity appears promising but is at present only in the early stage of experimentation.

Other workers have in the meantime reported the finding of the etiologic organism. Tunnicliff [8] isolated a green diplococcus and with it has developed a skin test [9] for susceptibility and a serum for use in prevention,[10] from which satisfactory results are reported.[11] Ferry and Fisher [12] report the finding of a green streptococcus, differing somewhat from the Tunnicliff organism, which produces a toxin, and they have prepared an antitoxin for use in prophylaxis and therapy. Park [13] presents arguments against the acceptance of an etiologic relationship between measles and either the Tunnicliff or the Ferry organism. Degkwitz [14] reports that he has grown the virus of measles and with it has produced a sheep serum which can be used in treatment.

The new serums are decidedly in the experimental stage and therefore could not be used in a health department plan in preparation for an epidemic. At best they could only be tried out cautiously if an opportunity was afforded. The convalescent serum, on the other hand, is sufficiently established so that it could be made a very considerable part of a health department measles project. The periodicity of measles makes it possible usually to anticipate an epidemic and to make preparations for it. This was done in Syracuse toward the end of 1925. In general the plan included, as has been reported in a previous paper,[15] the endeavor to obtain better care and hygiene for measles patients, but the central part of the program was the prevention of deaths in children of the "dangerous age group"; that

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2. Brownlee, John: Public Health Administration in Epidemics of Measles, Brit. M. J. **1**: 534 (April 17) 1920. Godfrey, E. S., Jr.: The Administrative Control of Measles, Am. J. Pub. Health **16**: 571 (June) 1926; Detection and Control Problems of Measles, Nation's Health **9**, December, 1927. Copeman, W. S. C.: On Some Recently Developed Methods for Measles Prophylaxis, J. Hyg. **24**: 27, 1925; The Prophylaxis of Measles with a Suggested Scheme for Dealing with Epidemics, Proc. Roy. Soc. Med. (Sect. Epidemiol. & State Med.) **20**: 79 (Aug.) 1927.

3. McCartney, J. E.: A Review of Recent Work on Measles, Lancet **1**: 93 (Jan. 8) 1927.

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5. Hektoen, Ludvig: Experimental Measles, J. Infect. Dis. **2**: 238, 1905; Experimental Measles, J. A. M. A. **72**: 177 (Jan. 18) 1919.

6. Hiraishi, S., and Okamoto, K.: On Prophylactic Inoculation Against Measles, Japan M. World **1**: 10 (Oct.) 1921.

7. Debré, R., and Joannon, P.: La rougeole: épidémiologie, immunologie, prophylaxie, Paris, Masson et Cie, 1926.

8. Tunnicliff, Ruth: The Cultivation of a Micrococcus from Blood in Preeruptive and Eruptive Stages of Measles, J. A. M. A. **68**: 1028 (April 7) 1917.

9. Tunnicliff, Ruth: Further Studies on a Diplococcus in Measles, J. Infect. Dis. **37**: 193 (Sept.) 1925. Tunnicliff, Ruth; and Taylor, R. E.: Skin Tests in Measles, J. A. M. A. **87**: 846 (Sept. 11) 1926.

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12. Ferry, N. S., and Fisher, L. W.: Measles Toxin: Its Preparation and Application as a Skin Test, as an Immunizing Agent and for the Production of an Antitoxin, J. A. M. A. **86**: 932 (March 27) 1926. Ferry, N. S.: Etiology of Measles, Am. J. Pub. Health **17**: 565 (June) 1927.

13. Park, W. H.: Studies of the Etiology and Prevention of Measles, City of New York Department of Health Weekly Bull. **16**, Jan. 8, 1927. Park, W. H.; Williams, A. W., and Wilson, M.: Relation of Tunnicliff and Ferry Diplococci to Measles, Am. J. Pub. Health **17**: 460 (May) 1927.

14. Degkwitz, R.: The Etiology of Measles, J. Infect. Dis. **41**: 304 (Oct.) 1927; Spezifisches Masernschutzserum vom Tier, München med. Wchnschr. **73**: 181 (Jan. 29), 248 (Feb. 5) 1926; Weitere Erfahrungen mit Masernserum vom Tier, Klin. Wchnschr. **5**: 1361 (July 23) 1926.

15. Ruhland, G. C., and Silverman, A. C.: What Can We Do About Measles? Am. J. Pub. Health **18**: 131 (Feb.) 1928.

is, children under 3. The protection of this age group included, of course, the use of measles convalescent serum. The plan formulated corresponds very closely with the scheme suggested by Copeman [2] in 1927 based on the earlier suggestions of Brownlee [2] in England and Godfrey [2] in this country.

ADMINISTRATIVE PLAN AND METHODS

The object of this report is to give in greater detail the part of the plan dealing with the use of measles convalescent serum and the results obtained.

Selection of Donors.—Since every adult in whom measles was reported was looked on as a potential donor, the diagnosis was verified in each case by a diagnostician from the bureau of communicable diseases. The patient's physician was communicated with and during convalescence the patient was asked to serve as donor after the object and purpose of the procedure had been explained. The history and physical condition was considered in selecting donors so as to rule out syphilis, tuberculosis and malaria. Only those having had true, primary, uncomplicated measles were selected and the serum was distributed only after the Wassermann test had been found negative and the donor had remained free from disease for some time subsequently. Only adult patients were used as donors. The blood was drawn as far as possible between the seventh and tenth days after defervescence of the patient. Only once was a second bleeding done by the end of a month, because of the urgent need. The maximum amount of blood withdrawn was 500 cc. Each donor was given from $10 to $25, depending usually on the amount of blood obtained.

Preparation and Distribution of Serum.—The preparation of the serum was carried out by the laboratory in the usual way. Five per cent phenol (carbolic acid) in an amount to make 0.5 per cent was added as a preservative and the serum was bottled in 4.5 cc. doses. Although it was aimed to pool two or three serums whenever possible, the urgency was usually so great that for the most part individual serums were used. At four different times during the epidemic a temporary shortage of serum occurred, but the New York State Health Department helped out with such amounts as it could spare. The supply was made available to physicians without cost at the city laboratory on giving the name, age and address of the patient for whom it was to be used. In turn, physicians were asked to fill out and return the reports that were mailed to them. Stamped, addressed envelops were enclosed with the blanks asking for the result of the serum administration.

Publicity.—The bureau of health education obtained the active cooperation of the press. Frequent newspaper stories emphasized the seriousness of measles to children under 3 and to those of older age in a weakened condition. The method of spread, the early symptoms which are usually overlooked, the need for proper care and hygiene from the very beginning of the onset were recounted numerous times. The fatality rate of previous outbreaks was analyzed and discussed. The usefulness of convalescent serum was mentioned whenever possible, and deaths from measles were prominently reported to stimulate potential donors.

Physicians were circularized as to the indications, dosage and time of administration of the convalescent serum. In times of shortage they were urged to make use of parental or adult blood. Full instructions were given in the health department bulletin, even as to the gage of needles to be used.

Administrative Personnel.—A nurse from the state department of health specially trained in measles control gave excellent help for more than a month in supervising the nurses' work. Five nurses were put on temporary duty for an average of sixteen days. They were trained hurriedly, but, being assigned to measles work only, they did quite satisfactory home visiting. Otherwise the staff nurses attended to the cases of measles in their districts while also taking care of other duties in the districts. It should be added that, owing to the recent introduction of generalized nursing at the time, many of the nurses coming from specialized services were not well equipped to do epidemiologic work. Lectures were given them during the course of the epidemic, and the epidemiologic assistant in the bureau of communicable diseases had to be keenly alert to errors. At various times additional clerical assistance was available for short periods. Extra physicians were not employed.

Epidemiologic Aspect.—A trained epidemiologic assistant examined the epidemiologic record in each case of measles, for contacts under 3 in the family or outside. In the case of private patients the physician was called on the telephone and asked whether he would like to make use of convalescent serum. It was necessary, of course, to employ tact and to be prepared to give correct information if questions were asked. In indigent cases the procedure was simpler, because the nurses could advise serum and district physicians of the health department or a bureau physician could be asked to administer it and follow the case through. Particular attention was given, of course, to infant boarding homes, child placing institutions and crowded sections generally.

Administrative Data and Observations.—During the epidemic about 7,000 cc. of convalescent blood was obtained from twenty-one different donors at a cost of $430, if only the compensation for the blood is considered. This gives an average of 333 cc. at a cost of $20.50 each. As about 415 doses were bottled, the average cost per dose, not counting regular administrative expenses, is about $1. It is interesting to know that about 42 per cent of the serum was administered by pediatricians, about 39 per cent by physicians of the health department and 19 per cent by general practitioners.

The scheme for measles control worked out very well, but at times the shortage in personnel was keenly felt. In distribution of serum close cooperation was necessary between the distributing station and the epidemiologic service. At times of shortage it was often necessary to decide between different claims for serum.

It might be added by way of an administrative observation or impression that with more effort more serum could have been obtained and administered. With the pressure of a rapidly developing measles epidemic, the regular personnel is likely to become swamped. For short periods it may be necessary at least to double the personnel in order to keep up with the epidemiologic work. In other words, it is not intended or desired to give the impression that the formulated plan was followed out perfectly. In agreement with Godfrey,[2] I feel that a thoroughly organized scheme for measles control presupposes almost complete subordination of all health work in the city to the fight against measles. In a few weeks of a measles epidemic, more babies may be lost than could be saved in a year by a baby clinic.

CLINICAL DATA, OBSERVATIONS AND RESULTS

The first report of the prevention of measles by convalescent serum was made by the French.[1] The application of convalescent serum to the prevention of measles outbreaks in institutions was greatly advanced by Degkwitz[16] in Munich, but probably its greatest application has occurred in Paris.[7] Numerous reports of the results obtained are to be found in the medical literature.[17]

Principles of Prophylaxis.—From the accumulated experience, it has been learned that a measles patient has the highest titer of measles immune bodies between the seventh and tenth days after defervescence. It tends to diminish gradually from then on, until, after about a month, it may reach a fairly constant level which usually persists for life, and probably accounts for the rarity of second attacks of measles. The convalescent serum, or a corresponding amount of plasma or whole blood, can be shown to have a very definite effect on the development of the measles virus in the human organism. This effect varies, however, according to the interval between the implantation of the virus and the injection of the serum. If it is given before exposure, it produces a purely passive immunity, which lasts, as is usual in passive immunization, only a short time, about two weeks, possibly three or four weeks. If it is injected early in the incubation period, that is, shortly after infection, passive immunity is still produced and possibly also some active immunity; measles will not develop and the immunity may last somewhat longer, possibly some months. With an efficient minimum dose measles may be prevented in the vast majority of contacts if a potent serum is given within five days after the first exposure or contamination. If the serum is given, however, in the latter stage of the incubation period, that is, from the sixth to the ninth day, measles cannot be prevented entirely, but its effect on the virus produces a modified or attenuated form of the disease, and with it also an active immunity which is probably lasting. If it is injected after the commencement of the period of invasion, the course of the disease is unaffected, unless, perhaps, an amount is given which would virtually correspond to a transfusion.[7]

There is no way of measuring the amount of virus or infection implanted in a given contact but it is probable that the amount of virus plays a part and that the greater the contact or contamination, the greater the amount of serum that will be necessary to produce either seroprevention or sero-attenuation.

The weight of the individual has a fairly definite bearing on the amount of serum that is required, the minimum effective dose being larger for older children than for infants. This minimum effective dose is given as 2.5 cc. by Degkwitz[18] for children under 4 years if given up to four days after infection, and is designated by him as one unit. Most workers, however, have found a larger dose necessary. Debré[7] counts 3 cc. as the minimum effective dose for infants and adds 0.5 cc. for every additional six months up to a maximum of 15 cc. at 15 years.

TABLE 1.—*Cases, Deaths and Serum Treatments in the Measles Epidemic: Syracuse 1926-1928* *

Year	Cases	Deaths	Fatality Rate	Children Under Three Years: Number	Children Under Three Years: Per Cent	Children Given Serum: Total Number	Children Given Serum: Under 3 Years: Number	Children Given Serum: Under 3 Years: Per Cent
1926-1928 *	8,036	24	0.29†	1,322	16.4	398	297‡	74.6
1928 *	2,431	6	0.24	340	13.9	164	127	77.4
1927	3,177	14	0.44	614	19.3	158	106	67.0
1926	2,428	4	0.16	368	18.4	76	64	84.2

* To June 1, 1928.

† In 1926, two deaths from whooping cough and measles were charged to whooping cough; in 1927, one death from scarlet fever and measles was charged to scarlet fever; in 1928, one death from congenital syphilis and measles was charged to syphilis. Measles was left off the death certificates for two children who died from bronchopneumonia complicating measles; the attending physicians in both cases have been asked to add measles to the certificates. If all these deaths were included, the total number of deaths would be thirty and the fatality rate 0.36.

‡ This number is an estimate of the number of cases in children under 3 years based on 259 cases for which complete reports are available.

Needless to say, there is considerable variation in the immune body content of different convalescents. For this reason it is much better to use the pooled serum of several convalescents. When the need is too urgent to wait for pooling and serum from a single donor has to be used, it is probably safer to give a somewhat larger dose in case the serum from the one donor should prove to be relatively poor in the content of immune bodies.

Obviously, too, serum or blood obtained a month or longer after the optimum time will necessitate proportionately and correspondingly larger dosage. The dose of such adult blood usually recommended is about 30 cc. for a child under 3 years if the whole blood is used.

Similarly, serum that has been preserved more than six months may be somewhat less effective than freshly prepared serum and may have to be administered in larger doses.

The indications usually are to use serum in all infants over 6 months and under 3 years. Infants whose mothers have had measles are usually wholly immune to measles in the first three or four months after birth, and less certainly up to five or six months. Infants

16. Degkwitz, R.: Ueber Versuche mit Masernkonvaleszentenserum, Ztschr. f. Kinderh. **25:** 134 (May) 1920; Ueber Masern Rekonvaleszentenserum, Ztschr. f. Kinderh. **27:** 171, 1920; Ueber Masernschutzserum, Deutsche med. Wchnschr. **48:** 26 (Jan. 5) 1922.

17. Among these reports are the following:
Nicolle, C., and Conseil, E.: Prévention de la rougeole au moyen de l'inoculation du sérum ou du sang complet des convalescents, Arch. d. Inst. Pasteur de l'Afrique du Nord **1:** 193, 1921.
Richardson, D. L., and Connor, Hilary: Immunization Against Measles, J. A. M. A. **72:** 1046 (April 12) 1919.
McNeal, M. D.: The Serum Prophylaxis of Measles, J. A. M. A. **78:** 340 (Feb. 4) 1922.
Weaver, G. H., and Crooks, T. T.: The Use of Convalescent Serum in the Prophylaxis of Measles, J. A. M. A. **82:** 204 (Jan. 19) 1924.
Zingher, Abraham: Convalescent Whole Blood, Plasma and Serum in Prophylaxis of Measles, J. A. M. A. **82:** 1180 (April 12) 1924.
Davis, R. C.: Immunization Against Measles with Convalescent Serum, M. Clin. North America **7:** 1259 (Jan.) 1924.
Gerlach, H.: Ueber Prophylaktische Schutzimpfung mit defibriniertem Erwachsenen-Blut bei Masern, Monatschr. f. Kinderh. **28:** 236 (June) 1924.
Regan, J. C.: Symptomatology of Measles Modified by Late Serum Immunization, J. A. M. A. **83:** 1763 (Nov. 29) 1924.
Sinclair, C. G., and Avery, S. D.: Serum Prophylaxis of Measles, Mil. Surgeon **55:** 697 (Dec.) 1924.
Park, W. H., and Freeman, R. G., Jr.: The Prophylactic Use of Measles Convalescent Serum, J. A. M. A. **87:** 556 (Aug. 21) 1926.
Haas, S. V., and Blum, Julius: Protective Value of Blood of Convalescents in Measles, J. A. M. A. **87:** 558 (Aug. 21) 1926.
Bivings, F. L., and Dickson, R. W.: Parental Blood Serum in Measles Control, Arch. Pediat. **44:** 629 (Oct.) 1927.
Benson, W. T., and Lawrie, J. D. H.: The Seroprophylaxis of Measles, Edinburgh M. J. **34:** 216 (April) 1927.
Richardson, D. L., and Jordan, H. P. B.: Measles Immunization, Am. J. P. Health **17:** 607 (June) 1927.
Karelitz, Samuel; and Levin, Samuel: Serum Prophylaxis by Use of Convalescent Serum, Adult Blood or Serum, Am. J. Dis. Child. **33:** 408 (March) 1927.
Kingsbury, A. N.: The Serum Prophylaxis of Measles, J. Hyg. **27:** 1 (Nov.) 1927.

18. Degkwitz (footnote 16, third reference).

whose mothers have not had measles previously do not have any natal immunity and need to be protected even in the first six months of life. Children 3 years old or over usually stand measles fairly well, but if there has been recent illness, or if the general condition or nutrition is poor, or if there is a tendency to bronchial, pneumonic or tuberculous infection, the child should be protected regardless of age.

Ordinarily it is better to give the serum late in the incubation period, that is, from the sixth to the eighth day, so as to give a modified form of the disease with its lasting or permanent immunity. In the case, however, of debilitated infants or those with illness, malnutrition, rickets, and so forth, it is more advisable to give the serum early enough or in sufficiently large dosage to prevent the disease entirely, even though the injection may have to be repeated at a later time.

Naturally, one does not expect a clinical method to give perfect results in all cases. Failures with convalescent serum may occur in from 1 to 3 per cent of cases. These may be unexplainable or may be due to a batch of poor serum or to the fact that the various factors influencing the size of the effective dose were not fully considered. At times it may happen that an unknown exposure occurred at a time previous to the known infection and that the serum was really given too late. It often occurs that when seroprevention is intended, modification or attenuation will occur and vice versa, even though indications have apparently been followed.

These seem to be reliable guiding principles in connection with the employment of convalescent measles serum or blood. It would not seem fair to consider unsuccessful results as failures if these principles have not been followed in one or more particulars.

TABLE 2.—*Contacts Given Measles Convalescent Serum, by Age: Results: Syracuse, 1926-1928* *

Age	Number Given Serum	Number Developed Modified Measles	Did not Develop Measles	
			Number	Per Cent
All ages	259	133	126	48.6
Under 1 year	69	17†	52‡	75.4
1 year	66	41†	25	37.9
2 years	55	36§	19	34.5
3 years	34	23‖	11¶	32.3
4 years	15	7‖	8#	53.3
5 years	11	5	6	54.5
6 years	2	..	2	**
7 years	4	2	2	**
8 years	1	1	..	**
9 years	1	1	..	**
10 years	..	..	..	**
11 years	1	..	1	**

* To June 1, 1928.
† One of these was given a dose of 1.5 cc.
‡ Seven of these were given doses ranging from 2 cc. to 4 cc.
§ Two of these were given doses of 1.5 cc. and one was given a 10 cc. dose of serum one year old on the fifth day and a second 5 cc. dose of fresh serum on the sixth day.
‖ One of these had an ear complication.
¶ One of these had a doubtful history of a previous attack of measles.
# In one of these, exposure was probable but not definite.
** Too few cases for computation.

Clinical Results.—Only part of the observations here recorded were made by me. Most of the data were obtained through reports of physicians who had administered serum. When the physician failed to give the results or did not have information about the outcome because he had not seen the patient after the serum was given, a nurse was sent to the home usually by the end of three weeks to inquire tactfully about the results.

It is extremely likely that the report of the modified cases is really below the actual number because mild symptoms such as slight coryza, a rectal temperature of from 100 to 101 F. or an evanescent rash about the neck for a day or part of a day would hardly be interpreted as measles by a lay person even though he was instructed about what to observe. It should also be mentioned that it is not often possible to differentiate a slightly modified case from a primarily mild one. Table 1 shows the number of cases for each of the three years of the epidemic, the number and proportion of children under 3, and the number and proportion under 3 given serum. Although 398 doses were distributed, complete and satisfactory reports are available only for 259, or about 65 per cent. The tables therefore deal only with this number. Table 2 gives the results when considered according to the age of the contacts receiving serum. With a standard dose, it is seen that in general the younger children escaped the disease.

TABLE 3.—*Contacts Given Measles Convalescent Serum by Number of Days from First Exposure: Results: Syracuse, 1926-1928* *

Day	Number Given Serum	Number Developed Modified Measles	Did not Develop Measles	
			Number	Per Cent
All Days	259	133	126	48.6
1 day	13	..	13†	100.0
2 days	16	6	10	62.5
3 days	22	10	12	54.5
4 days	30	18	12‡	40.0
5 days	64	34§	30¶	46.8
6 days	51	27	24	47.0
7 days	20	12	8	40.0
8 days	14	6	8	57.1
9 days	11	0‖	2#	**
10 days	7	4‖	3	**
11 days	3	3	..	**
12 days	..	..	..	**
13 days	1	..	1	**
Time unknown	7	4	3	**

* To June 1, 1928.
† Seven of these were given doses ranging from 2 cc. to 4 cc.
‡ One of these had a doubtful history of a previous attack of measles.
§ Three of these were given doses of 1.5 cc. and one was given a 10 cc. dose of serum one year old on the fifth day and a second 5 cc. dose of fresh serum on the sixth day.
‖ One of these had an ear complication.
¶ In two of these exposure was probable but not definite.
# One of these was given a dose of 1.5 cc.
** Too few for computation.

When, as in table 3, the cases are arranged to show the interval between exposure or supposed infection and the administration of serum, it is seen that on the first day 100 per cent were protected even with a smaller dose than the standard. It will also be noted that, for the sake of completeness, seven patients are included for whom the time interval is uncertain, indefinite or unknown, and eleven in whom serum was given after the ninth day. Of these eleven, four escaped; they may have been immune or may not really have become infected, or the exposure was probable rather than certain. Two of these developed otitis media, which in one went on to mastoiditis.

In table 4 the serum cases are arranged by days after exposure for those under 3 and those over 3, and it is seen that about 10 per cent more of the children under 3 escaped the disease. The reason that there is no greater difference is probably that the dosage remained constant for the most part. Usually no nice adjustment was made for age, time since infection, physical condition of the contact, and the varying antibody content of individual donors. It is therefore rather remarkable that failures are are not reported in this series. There was not a death in 398 serum treated cases, and in the 297 patients for whom records are available, not one developed bronchopneumonia and only two had ear complications, which are apparently explainable on the

basis that the serum was not given until the very approach of the onset or invasion.[19]

Modified Cases.—It is hardly necessary to go into a discussion of measles as modified by convalescent or adult blood or serum. From a statistical standpoint, a tabulation of symptoms is not worth so much when information is not definitely supplied on each point. Nevertheless, it is worth recording that in about half of those who developed modified measles, 82 per cent showed a shortening or absence of the prodromal period, 72 per cent a lessening of the catarrhal symptoms, 67 per cent a diminished or evanescent rash,

TABLE 4.—*Contacts Under Three Years and Over Three Years Given Measles Convalescent Serum, by Number of Days After First Exposure: Results: Syracuse, 1926-1928* *

	All Children			Children Under Three Years			Children Over Three Years		
Day	Given Serum	Developed Modified Measles	Did not Develop Measles	Given Serum	Developed Modified Measles	Did not Develop Measles	Given Serum	Developed Modified Measles	Did not Develop Measles
All Days	259	133	126	190	94	96	69	39	30
1 day	13	..	13	13	..	13†	..	..	..
2 days	16	6	10	12	5	7	4	1	3
3 days	22	10	12	16	6‡	10	6	4	2
4 days	39	18	12	22	13	9	8	5	3§
5 days	64	34	30	44	25‖	19	20	9	11¶
6 days	51	27	24	40	20	20	11	7	4
7 days	20	12	8	17	10	7	3	2	1
8 days	14	6	8	8	3	5	6	3	3
9 days	11	9	2	5	4	1	6	5#	1
10 days	7	4	3	5	2	3	2	2#	..
11 days	3	3	..	2	2	..	1	1	..
12 days	..	..	..	..	..	..	..	..	..
13 days	1	..	1	1	..	1	..	..	..
Time unknown	7	4	3	5	4	1	2	..	2

* To June 1, 1928.
† Seven of these were given doses ranging from 2 cc. to 4 cc.
‡ One of these was given a dose of 1.5 cc.
§ Three of these were given doses of 1.5 cc.
‖ One of these had a doubtful history of a previous attack of measles; one of these was given a 10 cc. dose of serum one year old on the fifth day and a second 5 cc. dose of fresh serum on the sixth day.
¶ In one of these exposure was probable but not definite.
# One of these had an ear complication.

and in 77 per cent the incubation period was more than twelve days. In seventy-six contacts given serum who had modified measles with an incubation period of more than twelve days, the range was from thirteen to twenty-two days with an average of fifteen and one-half days.

EFFECTS OF USE OF CONVALESCENT SERUM ON THE EPIDEMIC

Certain points about the Syracuse 1926-1928 epidemic are especially noteworthy. A study of measles epidemics in Syracuse from 1914 to 1925 shows that the outbreaks run through two years with a summer remission each year, and that the interepidemic interval is also two years.[15] In this outbreak measles has continued for three years, with the usual summer remission each year. This has also been the largest epidemic as far as records show and probably the largest in the city's history. More than 8,000 cases were reported, as against the previous high record of slightly more than 4,700 in the preceding outbreak in 1923-1924. This high incidence can in part be accounted for by better reporting, as a high proportion of cases was found by health department nurses which might otherwise not have been reported. In addition, areas adjacent to the city to the northeast, east and south were annexed at the beginning of 1926; this added about 10,000 to the city's population, or slightly more than 5 per cent in an area of 7 square miles, which constitutes about 28 per cent of the present total city area. About half of the added population constituted previously a single compact village, in which measles occurred during this epidemic in the city, thus helping to account in part for the increased number. Despite the very high incidence of 8,000 cases there were but twenty-four deaths, giving a fatality rate of only 0.29. Even with the indirect measles deaths added, the fatality rate is not higher than 0.36. And all through the epidemic every infant death from bronchopneumonia was investigated for measles. In the previous Syracuse epidemic the fatality rate was 1.38. Had the old rate obtained in this epidemic there would have been ninety deaths from measles instead of twenty-four.

In the previous report of the first two years of this epidemic [15] it was very guardedly concluded that the Syracuse management of the epidemic "apparently yielded substantial reduction in the mortality of children under 3 years of age." If so, what part might be attributed to the use of convalescent serum? Quite obviously, with the experience of but a single epidemic as a basis, conclusions must be limited and drawn with care. The virulence of measles undoubtedly varies as does the virulence of any other infectious disease. That virulence per se may be a factor in measles deaths appears to be indicated by the careful microscopic study made by Denton [20] in eleven fatal cases of measles. In three, he concluded that death was due in all probability to the virus of measles. But there is no definite basis for comparison. In the epidemic under discussion there is a strong clinical impression that the cases in 1928 were in general more severe than those in 1926 and 1927. Physicians say that more of the 1928 patients with measles developed bronchopneumonia and surgical mastoiditis and otitis media, though reliable figures are not available for comparison. Yet the fatality rate for 1928 is below the rate for the entire epidemic.

Fluctuations in the case fatality of measles are likely to be quite large. Freeman [21] points out that in Richmond, Va., where there had not been a striking change in the method of procedure, the variations in case fatality are much greater than those reported in our previous paper.[15] The Richmond figures have not been available to me, but Chapin [22] has published the figures for measles in Providence, which show a gross variation in fatality rate from 0.39 to 11.42. The higher figure occurred in 1919 with thirty-five cases and four deaths, and the lower in 1922 with 1,017 cases and four deaths. A comparison of the years 1918 to 1923 in Providence, taking only the years with more than 1,000 cases, shows a variation in fatality rate from 0.39 to 2.59, the lower figure going with the lowest incidence (for more than 1,000 cases) in 1922 with 1,017 cases, and the higher figure with the highest incidence in 1923 with 4,627 cases. A similar tabulation of measles in Syracuse for the years 1915-1925, again taking only the years with more than 1,000 cases, shows a variation in fatality rate from 0.46 to 2.54, the lower figure going with the next to the lowest inci-

19. One child, aged 5, not included in the reported series, developed double otitis media and bronchopneumonia as complications of measles. In this case the child developed the measles rash two days after the serum was given.

20. Denton, James: The Pathology of Fatal Measles, Am. J. M. Sc. **169:** 531 (April) 1925.
21. Freeman, A. W.: Personal communication to the author, April 11, 1928.
22. Chapin, C. V.: Measles in Providence, R. I., 1858-1923, Am. J. Hyg. **5:** 635 (Sept.) 1925.

dence (for more than 1,000 cases) in 1921 with 1,211 cases, and the higher figure with the next to the highest incidence in 1918 with 2,125 cases. In this period the lowest incidence was in 1915, with 1,748 cases and a fatality rate of 0.49. The highest incidence in this period was in 1923, with 3,371 reported cases and a fatality rate of 1.35. The similarity in the range of fatality rates in Providence and Syracuse in this comparison may be purely coincidental. Still, it may simply be pointed out that in this epidemic with the highest measles incidence the fatality rate is lower than any of the comparative figures. It will be granted, however, quite readily that conclusions cannot be drawn safely until future epidemics are studied and comparative data become available. It is safe to conclude, however, that convalescent serum adds an important instrument in the individual and communal fight against measles.

Finally, reference should be made to Godfrey's [23] stimulating study of measles outbreaks in New York state institutions for children. On the basis of his detailed study he suggests that the decline in fatality rates for the age group under 5, the group that produces the bulk of deaths, is due primarily to better management aided to some extent by convalescent serum. A careful analysis of the serum data given suggests that the various indications and principles outlined in this paper were not met, that many of the children received the serum too late, and that apparently allowance was not made for the various factors that affect the size of the minimal effective dose.

These indications, however, cannot be expected to be met in practice, since the available amount of convalescent serum is always likely to be insufficient when institutional children are to be treated. The great value of Godfrey's study lies in the warning not to overemphasize the value of convalescent serum to the neglect of proper management based on epidemiologic and hygienic principles.

EXPERIENCE WITH ANIMAL SERUMS

The opportunity to test out the animal serums presented itself during this epidemic, and the series, though small, will be reported separately. At this time only a brief analysis of the results is given.

Ferry's and Degkwitz's serums were tried out in children over 4 in a measles outbreak in children's institutions, and a few private patients were also treated when convalescent serum would ordinarily not be used.

In the first tests with Ferry's serum, one child came down with the first symptoms of the disease the day the serum was given and another child showed the symptoms four days later. None of the other treated patients or the controls became sick. The child who came down with measles four days after the serum had been given did not appear to have the disease modified. Two children, given the serum three and five days, respectively, after exposure, came down with severe measles. Intracutaneous tests with 1 cc. of serum twenty-four hours before the appearance of the exanthem failed to cause local inhibition of the rash (phenomenon of Debré).

The Degkwitz serum was given to fourteen children on the first rise in temperature to 100 F. or more about nine days after exposure. All came down with measles, as was expected, except that in three the fever disappeared after the first rise and the first symptoms of measles did not supervene until from three to six days afterward, when the temperature again went up. The disease in these treated patients did not differ from that in the controls, when the symptoms and the duration and height of fever were compared. In addition, two of the treated patients developed severe serum reactions and two developed bronchopneumonia as a complication. Of forty untreated patients in the institution only one had a mild bronchopneumonia.

In my experience, therefore, neither the Degkwitz nor the Ferry serum showed any evidence of value in measles.

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23. Godfrey, E. S., Jr.: Measles in Institutions of Children, part 1, 1915-1922, J. Prev. Med. **2**: 1 (Jan.) 1928; Use of Convalescent Serum, 1923-1924, part 2, ibid. **2**: 11 (Jan.) 1928; Use of Convalescent Serum, 1925-1927, part 3, to be published.

ABSTRACT OF DISCUSSION

DR. W. H. PARK, New York: So far as the convalescent serum in measles is concerned, I agree with almost everything said by Dr. Silverman. In my experience the potency of the blood of a convalescent patient does not diminish as rapidly after the cessation of the attack as was stated. My idea is that after reaching its greatest strength there is a gradual loss for a year or more, until it drops to the permanent level which most of those who have had measles maintain. As to the time of giving a prophylactic dose, I think it is a little risky to wait as long as the eighth day with the hope of greatly modifying the disease. I should prefer to make it the fourth, fifth or sixth day. Even then there will always be a certain number of partial failures. One thing I wanted to stress which Dr. Silverman just mentioned is the use of parents' blood. One can almost always get a parent who has had measles but one cannot always get convalescent serum. Recently when a number of babies were exposed and we did not have sufficient serum, I suggested that the blood of the healthy parents be used. The blood was obtained and given and the results were satisfactory. Several of the babies developed modified measles. One young child who was supposed to have had measles did not receive any injection of blood. This child developed a severe case. Our results with the Tunnicliff-Ferry antiserum have been similar to Dr. Silverman's; that is, we have not had any success. We do not believe that the Tunnicliff streptococcus is the cause of measles. Furthermore, we were not able to corroborate the value of the toxin made from the streptococci in differentiating the immune and nonimmune. So far as the sheep antimeasles serum of Degkwitz is concerned, we have had the very best chance to test it. It had absolutely no appreciable effect.

DR. GEORGE H. BIGELOW, Boston: We are very much interested in measles in Massachusetts this year, because so far each month we have had more cases of measles than at any similar month since the disease has been reported. We are not alone in this experience. London also has been overrun with measles. Of course, measles in children under 5 years of age and between 15 and 20 is a serious disease, although it is not so appreciated by the parents. The health officer should emphasize again and again the importance of avoiding exposure in young children. We found in recent sickness surveys that 50 per cent, or less, of the measles that occurs is reported to us, and that gives us an excuse for not controlling it; perhaps it is fortunate that we have a plausible excuse. I was very much interested in Dr. Park's mentioning the possibility of the effective utilization of parents' serum, because I despair of ever having human serum generally available. We have not been able to develop anything like an adequate supply in Massachusetts. As Dr. Park said, if we advise the physicians to utilize the parents' serum, there is something specific to offer, but will they use it?

DR. A. CLEMENT SILVERMAN, Syracuse, N. Y.: Dr. Park questioned the statement that by the end of about thirty days' convalescence the titer of measles immune bodies tends to have reached a constant level. That statement is based on the work of Debré and his co-workers in Paris, and is taken from the monograph by Debré and Joannon. In reference to the optimum time for giving measles convalescent serum to a contact, it is fairly well agreed that the sixth day after exposure is most

likely to result in attenuation of the attack. I placed the time at from six to eight days because, if the serum is given up to the sixth day with the idea of causing attenuation, frequently prevention results with only passive immunity; it is safer, then, to give it a little later, on the sixth or seventh day, and to get modification or attenuation rather than prevention; the eighth day was included because occasionally when it is found that the contact is in the seventh or eighth day after exposure it is felt that nothing more can be done, but in those cases a larger dose may still be effective in producing attenuation.

THE NORMAL AND THE ABNORMAL KIDNEY (PELVIS) AND URETER *

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Consideration of the normal kidney pelvis demands the study of several factors besides the shadow on the x-ray film. The pyelogram, of course, visualizes the pelvis and creates a tendency to disregard, or at least to consider too lightly, the related observations. It is not uncommon to see a beautiful pyelogram with the papillae clearly outlined, while the pelvis contains from 10 to 15 cc. of residual urine showing a great excess of epithelial and white blood cells, these conditions clearing up after ureteral dilation and pelvic lavage. Conversely, a large pelvic shadow with indistinct calices may not show pelvic retention, changes in the urine or subjective symptoms.

DIAGNOSTIC CRITERIA

The following data must be obtained and given proper recognition in order that one may arrive at a correct reading of the pyelogram. It is impossible to give these factors in any rigid order of importance, as each is dependent on the others and all must be considered:

1. Careful history and physical examination.
2. Appearance of the ureteral orifices.
3. Free or difficult passage of catheter to pelvis.
4. Residual urine in kidney pelvis.
5. Examination of urine catheterized from kidney pelvis, particularly in regard to microscopic observations, specific gravity and the character of the flow from the catheter.
6. Status after properly directed and adequate treatment:
   (*a*) Change in contour of papillae.
   (*b*) Change in urine.
   (*c*) Improvement or other change of subjective symptoms.

History and Examination.—When properly taken and carefully studied, the history and examination may disclose valuable information. Attacks of hematuria, pyuria or changes in micturition, such as dysuria, frequency and nocturia, must always be considered and recorded. Pain in the loin associated with various urinary symptoms may direct the attention to an acute or subacute pyelitis, pyelonephritis, pelvic or ureteral stone, or possibly acute retention of urine within the pelvis. Tumor in the region of the kidney, palpated bimanually, may be the deciding factor in the diagnosis of a renal neoplasm when the pyelogram is questionable. Pain and swelling in the loin may disclose a perinephritic abscess and contraindicate pyelography. Indefinite pain in the upper or lower part of the abdomen, especially if associated with urinary changes, should receive careful consideration.

Observation of the Appearance of the Ureteral Orifice.—While the normal orifice is not always an indication of a normal ureter and pelvis, an inflamed, gaping or edematous ostium, or one surrounded by a zone of bullous edema, must be seriously considered before a diagnosis of normal pelvis can be made. As pointed out by Buerger many years ago, the orifice very often gives a clue to existing pathologic conditions at a higher level in the urinary tract. Any cause for obstruction at the ureteral orifice, as partial atresia or ureterocele, should be recorded.

Passage of Catheter to Pelvis.—Careful note should be made of the passage of the catheter. Any obstruction making extraordinary manipulation necessary is potentially a cause of urinary stasis with a resultant dilatation above. Soft stones in the ureter may often be detected by the catheter when the roentgenogram is negative.

Residual Urine in Kidney Pelvis.—The pelvis is simply the enlarged upper portion of the ureter, both anatomically and embryologically. The same relation holds true, functionally. Its sole function is to collect the urine secreted from the tubules of the papillae and pass it along through the ureteropelvic junction into the ureter. It should at no time act in the capacity of a bladder or container of secreted urine. Residual urine implies some obstruction to the drainage of urine, with a resultant back pressure. It has been my experience that pelves retaining more than 2 or 3 cc. of urine, regardless of pyelographic observations, were benefited by dilation of the ureter and lavage of the pelvis.

Analysis of the Catheterized Urine.—This must be taken into account. A correctly catheterized kidney urine should show very few white blood cells and a correspondingly small number of epithelial cells. Any excess of either raises a question of pyelitis. The specific gravity and character of the flow from the catheter will decide between residual urine and an excessive polyuria due to catheter or other irritation. Red blood cells, when not due to catheter traumatism, may be an index of tuberculosis, calculus, neoplasm or chronic nephritis. Tube casts associated with any of these or alone indicate a pyelonephritis or a further advanced renal pathologic condition.

Status After Treatment.—This may be called the therapeutic test and may be divided as follows: (1) changes in the contour of the pelvic shadow; (2) changes in the urinalysis, and (3) changes in the subjective symptoms.

The benefit derived by patients with normal shadows of the pelvis and ureter after treatment occasionally causes one to question one's interpretation of the original pyelogram. As has been stated, this is especially true of patients with residual urine and in cases showing an excess of white blood cells and epithelial cells.

THE PELVIC SHADOW

The object of pyelography is not to show the outline of the pelvis per se but rather to outline any pathologic changes in the portion of the kidney adjacent to the pelvis; namely, the papillae, the columns of Bertin and the intervening stroma.

The normal kidney pelvis varies greatly in appearance. Embryologically it should consist of the pelvis proper, two major calices, a superior and an inferior, and the minor calices. The major calices, however, are usually three in number: superior, medial and inferior. The interpretation of pyelograms, both normal and otherwise, varies greatly. Some authorities are very liberal in their reading of the normal shadow while

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others will locate pathologic changes in apparently identical pictures. There are, however, some essentials which may be stressed.

The minor calices surround the renal papillae, which in turn contain from eight to ten secreting tubules. The shadow of the minor calices is the crucial point in the pyelogram. Unless these are cup or lily shaped with their borders distinctly outlined, one cannot diagnose a normal pelvis. Flattening or clubbing of the minor calices always spells recession of the papillae because of pressure interfering with the delicate blood supply, stasis of urine in the tubules following dilatation and thickening of the tubules due to associated inflammatory processes. This resultant injury to the papillae bears a direct relation to the amount of clubbing or recession of the calices. In some cases further advanced, we find streaks radiating from the border of the calix. This is caused by the distending fluid entering the secreting tubules, possibly because of overpressure but more often because the tubules have become dilated and inelastic and do not offer a barrier to the injected fluid. The shadows in the tubules when not due to overdistention indicate pyelonephritis. These changes are the result of the constant, although perhaps slight, pressure of urine retained within the pelvis. Unless arrested by appropriate treatment, the recession advances until the kidney structure is destroyed and there remains nothing but a sac formed by the capsule and stroma—calices becoming pouches separated by fibrous bands which are the remains of the columns of Bertin. This forms one class of surgical kidney and the cure is nephrectomy.

The ureteropelvic junction is next in importance. It is impossible to conceive how a pyelogram with a sharp angle at this point can be considered normal when the function of the pelvis is kept in mind. Angulation between the pelvis and the ureter undoubtedly is the cause of more hydronephrosis than is generally conceded. When taking pictures of a hydronephrotic kidney, it is frequently impossible to show any distention of the ureter. This holds true in cases in which the possibility of stenosis of the ureteropelvic junction can be eliminated. Such pictures often show the ureter entering the pelvis at an abnormal location, which in itself implies angulation. The junction, therefore, should have a smooth generous curve to assure free drainage and should be situated opposite and somewhat below the hilum to lessen the possibility of angulation. The major calices and the pelvis proper also should be well curved and should not contain straight lines or sharp angles. To repeat, the normal pelvis should show sharply outlined, distinct, properly shaped calices. The ureteropelvic junction should be curved and situated opposite and slightly below the hilum. The major calices and pelvis proper are also to be curved; acute angles and straight lines do not have a place in a normal pelvis or ureter.

The normal ureter is not a perpendicular tube extending from the kidney to the bladder but makes two definite curves in its course, one just below the ureteropelvic junction, and the other as it passes over the brim of the ilium and swings behind and into the bladder. Ureterograms are more uncertain to obtain and more difficult to interpret than pictures of the pelvis. Again, opinions differ greatly as to normal and pathologic conditions, especially in diagnosing stenosis. Filling defects and muscular action of the circular coat play quite a rôle and must be seriously considered. The diagnosis of stenosis can usually be made more readily and surely by the method used in the urethra; i. e., by wax tipped or bulbous catheters to elicit a hang on withdrawal.

Angulations, kinks and tortuosities of the ureter are real entities and can be best shown by stereoscopic ureterograms. The stereoscope will often reveal a generous curve in the third dimension whereas the flat films show a marked angulation or kinking. However, their presence or suggestion always enters into the consideration of the normal pelvis and ureter.

The musculature is important in the conformation of the ureter. This coat consists of three layers, an inner longitudinal, a middle circular and an outer longitudinal (Braasch). The circular fibers in the wall of the ureter are accentuated at several levels; at the ureteropelvic junction, at the site of the iliac vessels, in the broad ligament in women, and again at the vesical orifice. At these points dilatation of the ureter is limited, and it is interesting to note that these are the most common sites of stenosis. Distention of the ureter between these reinforcing rings, as they are designated by Kelly, varies greatly. Goldstein gives the figures as from 2.3 to 3.3 mm., while Braasch gives 5 mm. as the mean and from 1.5 to 7 mm. as the extremes of normality.

ANOMALIES

The etiology of anomalies of the upper urinary tract is, of course, embryologic, a subject too vast to be dealt with in this paper. It will suffice to mention the more important of these conditions and their relation to pathologic conditions of the kidney or ureter.

Double or bifid pelves are possibly the most common malformations seen in the upper system. They as a rule have little bearing on pathologic conditions of the pelvis unless associated with bifid ureter, when either section, usually the upper one, may show a dissociated pyelitis or pyelonephritis.

Double kidney with separate or fused ureters is possibly the next in order of frequency. Unilateral duplication is not infrequent and is found on the left side in the majority of cases. Bilateral duplication of the kidney and the ureter is rather a rare condition, few cases having been reported. In these cases the ureters may have separate openings into the bladder or may fuse at a higher point. In all types of double kidney the upper organ is more likely to be the anomalous one, and hence the more frequent seat of inflammatory or other changes.

FUSED KIDNEYS

The fused kidney occurs in several forms, the most common being joined at the upper or lower poles, producing the so-called horseshoe kidney. In this type the pyelogram will show the pelves tending to approximate each other at the point of fusion. The ureteropelvic junction is distorted or the ureter may enter the pelvis at an abnormal location. Because of this interference with the outflow of urine, fused kidneys rarely show normal pelves and are very apt to be the seat of hydronephrosis and calculus formation. Other types of fused kidneys include the cross dystopic, in which the two kidneys are found on the same side; the sigmoid or wholly fused kidney, and a few other rare types. Young includes polycystic kidney in this group, but it is questionable whether this is an anomaly or a pathologic condition.

TORSION OF THE KIDNEY

Torsion of the kidney is also rather rare, although I have seen five cases thus far. Four of the cases have shown the rotation from above downward and one has

shown lateral rotation. The constant pressure of the retained urine on the papillae and kidney stroma causes the usual signs of retention and compression.

Double ureters are usually associated with double kidneys, though they may fuse above the bladder and enter a single pelvis. Tortuosities, kinks and strictures, although sometimes congenital, are in the main pathologic conditions and are usually so considered.

Ureterocele is not infrequently seen and is always associated with stenosis of the vesical orifice. It is at times the seat of calculus formation and is always the cause of some back pressure. Destruction of the sac by fulguration or section with the cystoscopic scissors is a very simple procedure which should be carried out in all cases encountered.

Abnormal shortening of the ureter is associated with dystopic kidney. This malformation is congenital and is caused by an arrest of the ascending ureteral bud early in gestation. The true pelvic kidney has its origin in the same defect of intra-uterine life.

CONCLUSIONS

1. The diagnosis of normal pelvis depends on several factors in addition to the pyelogram and demands close association of the roentgenologist and the urologist.
2. Pyelograms should be made only when the diagnosis cannot be made by other examinations or when necessary to confirm the diagnosis.
3. The pyelogram is only an index to the status of the adjacent kidney structure.
4. The function of the pelvis is merely to collect and pass urine into the ureter.
5. The normal pelvis should not contain any residual urine.
6. The earliest pathologic changes due to obstruction are found in the minor calices.
7. Pathologic changes are very often associated with malformations of the urinary tract.

Jenkins Arcade Building.

ABSTRACT OF DISCUSSION

DR. GEORGE W. GRIER, Pittsburgh: We cannot be reminded too often that the clinical aspects of all cases must be taken into consideration. The urologists do not fall into the error of placing too much stress on the roentgenologist's report. I am glad that Dr. Anderson has the strength of mind to reserve his own opinions and take into consideration all of his own observations rather than to attempt to make a diagnosis from the roentgenologist's reports, alone. I think the emphasis on this point is very essential to us. One important point is that it is often more difficult to recognize the normal than the abnormal. Definitely abnormal cases will be recognized as such by all of us, but often we have to spend a great deal of time and care and thought in deciding whether a certain case is normal. Having decided that it is abnormal, the differential diagnosis may be more difficult. I was glad to hear Dr. Anderson urge the use of stereoscopy in pyelography. The trend toward efficiency reflects itself in the practice of radiology. As time goes on, and I suppose with more keen competition, we are prone to make fewer exposures in our examination of patients. I suggest a simple method of utilizing stereoscopy in pyelography. It is not uncommon practice, and very good practice, to make at least two 14 by 17 plates. Most urologists will ask for a plate made immediately after injection of the kidney pelvis, and then another one made after withdrawal of the catheter and the injection of the ureter. All that is necessary to do with the ordinary Bucky diaphragm technic is to shift the tube for the second exposure and these two plates will stereoscope very nicely.

DR. CHARLES A. WATERS, Baltimore: I wish to emphasize Dr. Grier's remark as to the urging of stereoscopic pictures. In the Brady Clinic pyelograms and cystograms are being made stereoscopically, and I feel that the expense and trouble are greatly justified by the results obtained. Many epoch-making improvements which have come out in the last few years establish a close entente cordiale between roentgenology and urology; particularly among those, I think, are the new cystoscopic x-ray tables developed by Braasch, Young, Squire, Lower and others, and the Bucky diaphragm. With these two modern improvements it is now possible to obtain excellent pictures in which it is almost a surety that a diagnosis can be made not only as to disease but as to anomalies of almost any type in the urologic tract as well. If one is familiar with the pathologic conditions of these different lesions, how the processes start, and what they do to the anatomic structures of the organs of the urinary tract, it is a very interesting and pleasant specialty.

THE RÔLE OF THE LENS CAPSULE IN THE COMPLICATIONS OF THE CATARACT OPERATION*

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If infections which vary in severity from iritic congestion to panophthalmitis are excluded, the most important complications after cataract operation are due primarily to the lens capsule.

The lens capsule is an epiblastic structure, a secretion-product of the lining epithelium. During the formation and maturity of the cataract, very little change occurs in the lens capsule until the cataract shows hypermaturity. The capsule from shrinkage of the cortex then becomes wrinkled and thickened. Irregular white bands and spots develop on its surface from proliferation of the anterior capsular epithelium. Its principal property is its elasticity. The capsule has no deleterious action in itself; microscopic study has failed to show any unfavorable action caused by any of the hyaloid membranes in the eye unless it is its permanence or changes resulting from the adjoining epithelial cells. The lens capsule remains clear in all lenticular opacities, but the capsular epithelium may show extensive changes through hypertrophy, proliferation and organization into connecting tissue and degeneration.

In the operation for cataract, the capsule may offer the following peculiarities: In the early stages the capsule is readily cut by any cutting instrument; from its elasticity, the wound tends to keep open and its edges to curl. The facility of grasping the capsule with the capsule-forceps depends on its thickness, on the nature of the cortex and on the tension of the lens bag. Thus, if the capsule is thin and tense, the forceps tend to slip and it is difficult to get a good hold, and the use of a cystotome then becomes necessary. If the capsule is loose from wrinkling and from shrinkage of the cortex, it can be easily grasped; finally, if it is thickened, it is resistant and the sclerosed nucleus and even the entire lens may be subluxated. The capsule forceps under these conditions readily dislocate the cataractous lens, and, if the hyaloid is adherent, vitreous prolapse ensues.

METHODS OF OPENING THE CAPSULE

The opening of the capsule has been effected in various ways by different operators; mostly it consists in an extensive and promiscuous laceration.[1] The opening in

* Read before the Section on Ophthalmology at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 15, 1928.

1. Knapp, Hermann, in Norris and Oliver: System of Diseases of the Eye, 3: 809.

the lens bag varies in extent according to the instrument used; it tears along the lines of least resistance, which is often not premeditated, and this opening is enlarged by force from the emerging lens contents.

Many operators employ capsule forceps, of which there are many patterns. Generally the anterior capsule lying in the pupillary opening is removed. If the cortex is soft and watery, and the capsule is thin, a cut only in the capsule is effected, similar to that made by the cystotome. Some operators have endeavored to circumscribe the capsular piece before grasping it with the forceps. The capsule forceps remove a portion of the anterior capsule, especially if the capsule is thickened, and leave a central clear space, though objection is based on the fear that the suspensory ligament may be ruptured. In thin capsules, however, the results with the capsule forceps do not differ from promiscuous laceration. In thickened capsules, the entire lens and its contents can be pulled out. An old method, now again popular in London, is to split the capsule with the knife on its passage through the anterior chamber. H. Knapp abandoned this because the opening was insufficient in many cases and it rendered an exact execution of the corneal section more difficult.

Previously, some form of cystotome was generally used, and every imaginable opening attempted, but the results were often quite uncertain.

H. Knapp consistently made a peripheral capsulotomy in order to traumatize the eye least, and with a view toward the necessity of a subsequent discission. Elschnig [2] objects to this peripheral incision on account of possible injury to the suspensory ligament, especially in restless patients.

The position and extent of the opening of the capsule have been much varied in theory; practically, the resulting opening has been a very nondescript sort of affair.[3] Elschnig thinks that the form of capsular opening is rather immaterial.

The particular style or direction of the capsulotomy is generally supposed to have some bearing on the healing process, and also on the frequency of the after-cataract. Beard quotes Panas in saying that it is not so much the method pursued in capsulotomy as the amount of abandoned lens remains that predisposes or not to the formation of secondary cataract. Beard [4] gives a diagram of various procedures with the cystotome; he himself prefers the peripheral capsulotomy of Knapp.

The resulting opening or closure if the wound edges are approximated is of the greatest importance in determining the absorption of any retained cortex and the development of the after-cataract, which in turn determines the visual result obtained.

AFTER-CATARACT

The varieties of after-cataract are:

1. Cortical after-cataract, in which the small capsulotomy wound closes promptly and the retained cortex remains in a closed bag; the opaque membrane then manifests itself early. Cortical remnants, if exposed to the action of the aqueous, gradually absorb. If the capsular opening is small, it can close by proliferation of the capsular epithelium, and the retained cortex remains undissolved as a membrane of varying thickness, or the epithelial cells lining the anterior capsule proliferate and form "abortive and opaque lens fibers" as is well illustrated in Parsons' [5] text book. This comes on slowly, and disturbs vision a year or more later.

2. Capsular after-cataract, caused by the thickening of the capsule or proliferation of capsular epithelium. This after-cataract may be due to wrinkling of the posterior capsule by contraction of the adherent anterior capsule. The capsular epithelium, on the other hand, may proliferate at the margins of the capsule opening, and the lens fibers are found in the form of round balls (Tropfennachstaar [6]).

3. Iritic after-cataract. A vascularized membrane lies on the thickened capsule adherent to the pupillary margin. Collins [7] describes this as due to the formation of adventitious fibrous tissue which is always the result of some septic process with plastic exudate which organizes into fibrous tissue.

Henry Smith in his book on the treatment of cataract speaks in his picturesque manner of after-cataract as one of the evergreens of ophthalmic surgery. With after-cataract, iritis is frequently associated, which binds down the margin of the iris to the after-cataract. He thinks that this iritis is almost always due to the capsule and lens matter left behind in the operation, as it is absent after extraction in the capsule. The after-cataract, Smith believes, is resented by nature as a foreign body. The complications are due to the presence of the after-cataract and to the healing of the capsule in the wound. The visual impediment must be corrected by discission or extraction of the entire after-cataract. An after-cataract can be definitely avoided only by the intracapsular method.

Collins says that the frequency of after-cataract depends on the method of capsulotomy employed and on the cortical matter remaining at the operation. Opacity due to retained lens matter or to proliferation of the capsule cells is unlikely, if a sufficiently large piece of the anterior capsule is removed. The third form of opacity can be lessened only by following measures to avoid septic endophthalmitis.

AUTHOR'S OBSERVATIONS

The discussions in the literature of the various methods of discission do not take up their relation to the development of the after-cataract, and how much the after-cataract can be influenced by the methods of capsulotomy. I have therefore reviewed my private records of 200 successive capsulotomy operations. These operations were combined extractions for senile cataract, and were done before the end of 1926. The cases include (1) those in which an intracapsular operation was attempted with the blunt (Kalt) forceps, but the capsule ruptured, thus removing a greater or lesser part of the anterior capsule; (2) those in which toothed forceps were used for various reasons, supplemented in a small proportion of cases by a peripheral cystotomy, if the piece of capsule removed was insufficient; (3) those in which the use of the blunt forceps was preceded by a single or double vertical cystotomy, and (4) those in which a T-shaped cystotomy was used.

These records gave the following figures for the frequency of after-cataract:

1. Eighty-seven blunt (Kalt) forceps, with four discissions and two deWecker operations.

2. Seventy-six toothed forceps, with five discissions and three deWecker operations; in nineteen, a horizon-

2. Elschnig: Graefe-Saemisch-Hess Handbuch.
3. Beard, C. H.: Ophthalmic Surgery, Philadelphia, P. Blakiston's Son & Co., 1910, p. 554.
4. Beard: Ophthalmic Surgery, p. 555.
5. Parsons, J. H.: Diseases of the Eye, P. Blakiston's Son & Co., 1912, p. 306.
6. Elschnig, in Graefe-Saemisch-Hess Handbuch, p. 1150.
7. Collins: Tr. Ophth. Soc. U. Kingdom **34**: 42.

tal peripheral cystotomy was added, with two discissions, two deWecker operations and one extraction of secondary membrane.

3. Eleven vertical cystotomy and blunt forceps, with three discissions and one deWecker operation.

4. Seven T-shaped cystotomies with three discissions.

This shows that, in 200 extractions, secondary operation for after-cataract was necessary in twenty-six, or about 13 per cent.

Analysis of these cases further shows that if the capsular opening is a sufficiently large one, as was obtained in 163 cases, when the blunt or toothed capsule forceps were used, secondary operation was necessary in fourteen. The addition of a peripheral cystotomy, while it facilitated the extraction of the cataract, increased the after-cataract operation to five in fourteen cases. The vertical cystotomy, single to facilitate grasping the capsule with the blunt forceps and removing a large piece, or the two vertical cystotomies with the attempt to remove the intervening capsule with the forceps were not successful in reducing the frequency of the after-cataract to less than four in eleven operations. Finally, the T-shaped cystotomy gave the largest proportion of secondaries, three out of seven.

When the cause for the opaque membrane is analyzed from another angle, though I am fully aware of the difficulty of accuracy in this, there were eight cases of retained cortex; fifteen cases of uniform thickened membranes or of one or more thickened bands, and three cases of pronounced iridocyclitis.

The discission operation practiced was with the Knapp or Ziegler knife-needle, entered at the limbus, a T-shaped incision being made in seventeen; the deWecker operation was used in eight cases and extraction of secondary cataract in one. The method of discission was the one devised by H. Knapp, the thinnest portion of the after-cataract being selected for operation. The deWecker operation consisted in a small keratome incision at the limbus, the thickened membrane or band being divided with the Esberg capsule-scissors. In one case, after a keratome incision at the limbus, the entire after-cataract was extracted with the blunt (Kalt) forceps.

GLAUCOMA

Glaucoma is the most important complication. Excluding the fortunately rare epithelial-lined cyst in the anterior chamber, iritis with altered aqueous is a frequent though transient cause. Collins particularly has shown that glaucoma develops from adhesion to or entanglement of the lens capsule in the extraction scar. This holds the anterior of the ciliary processes against the posterior surface of the cornea, blocking the angle of the anterior chamber. This is sometimes caused by inflammatory exudate, which in contracting produces the same effect. The amount of advance in the lens capsule depends on the position of incision; thus, in adhesion of lens capsule to limbal incision, glaucoma is rare. Adhesion of the hyaloid to the corneal scar will have the same result.

In this series of 200 capsulotomy cataract extractions, glaucoma occurred in six. These cases in brief are as follows:

CASE 1.—*Hypermetropic eye, mature cataract.* Combined extraction with capsule forceps, followed by glaucoma with capsular adhesion. Iris columns bulging; double iridectomy over iris columns. Division of capsule with capsule scissors; recovery. Sight, 20/40; tension, 28.

CASE 2.—*Morgagnian cataract.* Combined extraction with capsule forceps, followed by pneumonia and iritis. Glaucoma two years later. Bulging iris, and anterior peripheral adhesion of iris. Trephining with iridectomy. Sight, 20/20; tension, normal.

CASE 3.—*Myopia, nuclear cataract.* Combined extraction with capsule forceps. Retained cortex, iridocyclitis and glaucoma. Operation three months later consisting of anterior sclerotomy; capsular bag seized. Vitreous prolapse and return of glaucoma resulted. Lost sight of patient. Subsequent enucleation.

CASE 4.—*Swollen cataract.* Preliminary iridectomy followed by glaucoma. Posterior sclerotomy, repeated. Cataract extraction. No restoration of anterior chamber. Return of glaucoma. Sight, 0.

CASE 5.—*Posterior cortical cataract.* Combined extraction and discission. Glaucoma and bulging iris at iris columns. Relieved by iridectomy. Sight, 20/40. Macular changes. Tension, normal.

CASE 6.—*Nuclear cataract.* Combined extraction. Retained cortex with resulting glaucoma. Cortex in bag evacuated. No iritis. Return of tension. Trephining. Adherent band of capsule with return of glaucoma. Sclerectomy, division of band. Subsequent discission with capsule-scissors. Sight, 20/20; tension, normal.

I do not know of any condition in cataract work that is more dangerous to the eye and more difficult to treat than glaucoma. Certain eyes are predisposed to capsular trouble, such as small hypermetropic eyes. An incorrectly performed section here exacts a terrific toll, for in those eyes the section must be scleral. The ideal result after the capsulotomy operation is that the capsular membrane should be deeply placed, with a clear, uniform space between it and the iris. Contact of the iris at the columns of the coloboma to the periphery of the cornea as a result of adhesion of the lens capsule to the extraction scar, or adhesion of the capsule within the coloboma, are the usual causes. Glaucoma may, however, result from adhesion of the hyaloid membrane or of the vitreous to the corneal scar. One of the great advantages of the simple extraction and of the intracapsular extraction consists in the necessary avoidance of this condition.

In 1910, I [8] reported on glaucoma from adhesion of the lens capsule to the cornea. Since then, I have been struck by the presence of this condition in most of the cases which presented serious complications after cataract operations. If the adhesion is broad, and thickened by organized inflammatory exudation, the condition is very difficult to treat. A faulty corneal section is generally present. Iridectomy with division of the capsular adhesion gives relief for a time, but the condition generally recurs. Sclerectomy operations do not give the same good results that they give in noninflammatory glaucoma, and cyclodialysis has failed in my hands. In the early cases, and in those cases operation must be performed early, the adherent band must be divided or, better, resected, as in many cases there is a great tendency for the incision wound in the capsule to reunite. If this does not relieve the glaucoma because the pathologic condition has led to organized closure of the filtration angle, a sclerectomy must be done.

The most important preventive is a properly placed corneal section. Next is correct technic of the capsule maneuver. Stroking back possible capsular entanglements is most important. Capsulotomy which avoids tags is essential. Careful replacement of possibly entangled capsule with the spatula, and freeing the corneal section of these tags at the close of the operation, usually prevent this unfortunate complication. A great

8. Knapp, Arnold: Glaucoma from Adhesion of the Lens Capsule to the Cornea, Arch. Ophth. **39**: 451, 1910.

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step in advance would be a method of illumination by which the capsule could always be seen during operation. Simple adhesion, even if broad, of the capsule to a limbal wound rarely causes glaucoma.

GLAUCOMA AFTER DISCISSION

If the discission cuts too deeply into the vitreous or causes traction on the ciliary processes, glaucoma may ensue in the first days after discission. Mild iritis with increased tension occurs most frequently; it subsides with atropine and ice. If iritis is not present, the colloids of the vitreous now introduced into the anterior chamber may be the cause for the glaucoma, or the prolapsed vitreous causes circular adhesion of the round pupil. If this does not give way to simple remedies, paracentesis or iridectomy is indicated.

COMPLICATION FROM RETAINED CORTEX

Even if the capsulotomy opening is large, clouded cortical masses resist resorption, notwithstanding all treatment for weeks, independent of the form of operation, apparently from individual peculiarities. Free cortex in the anterior capsule is usually absorbed. The iris may remain intact or posterior synechia develop.

In this series, there were two cases in which there was very slow absorption of cortex. The cataract was nuclear in myopic eyes. In one, it took five months for the pupil to clear and the vision to reach 20/30, but neither glaucoma nor iritis developed in either case.

Cortical remnants absorb if the capsular wound is large, unless inflammatory reaction sets in and the capsular wound closes with more or less iritis. The cause for this iritis is not yet determined. Some see in it a result of a low-grade infection, and others the irritation from capsule and retained cortex. The latter view is substantiated by the clinical observation of its absence in intracapsular cases. Verhoeff and Lemoine [9] have explained this phenomenon on the basis of phacoanaphylactic endophthalmitis. This has been denied by Rötth.[10] Sanford Gifford [11] thinks that the majority of these reactions are due to toxicity of the lens matter itself. In none of my cases did the sensitivity to lens protein test prove positive.

The absorption of cortex is facilitated by hot compresses, subconjunctival injections of 2 per cent sodium chloride or 3 per cent ethylmorphine hydrochloride, and ethylmorphine hydrochloride locally in increasing concentration. The pupil should at first be kept dilated with atropine, but atropine to my mind retards the absorbing processes, and better results are obtained with physostigmine. I therefore vary from treatment with atropine to several days' treatment with physostigmine, and return to the atropine as was suggested by Wandless. The retained cortex causes glaucoma, particularly if it is shut off by adhesions; operation is then necessary.

10 East Fifty-Fourth Street.

9. Verhoeff and Lemoine: Internat. Cong. Ophth., 1922.
10. Von Rötth, A.: Arch. Ophth. **55**: 103 (March) 1926.
11. Gifford, S. R.: Allergic and Toxic Properties of Lens Protein, J. A. M. A. **85**: 351 (Aug. 1) 1925.

Tuberculotherapy.—If we compare the treatment of pulmonary tuberculosis as it has developed during the past fifty years with therapeutic tendencies which can be observed in the treatment of other diseases, we are impressed with two amazing facts. One is the relative indifference toward tuberculous infection, and the other a reluctance to apply more active and radical measures in the treatment of pulmonary tuberculosis. The teachings of our research workers have so far failed to lead to a broad conception of tuberculotherapy.—Fischel, Karl: *Am. Rev. Tuberc.*, November, 1928.

LOSS OF VITREOUS IN CATARACT EXTRACTION *

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For the purpose of discussion a somewhat arbitrary and elastic division of vitreous loss may be made into three classes which fairly well explain themselves; namely, small, moderate and large. By a small loss I mean that occasioned when vitreous presents in the wound and a few drops escape from the eye. A moderate loss would cover an amount up to that sufficient to fill the anterior chamber, or the equivalent of 10 drops of a fluid of a consistency similar to that of the vitreous. The loss of a greater quantity than that would be considered a large vitreous loss. While this may occur at any stage of the operation, it is most common after the delivery of the lens, especially if the lens is removed in the capsule. At this stage of the operation vitreous loss is least disastrous, since the main object of the operation is accomplished and further manipulation may not be necessary. If the lens has not been delivered, the efforts necessary to expel it will surely cause a greater loss of vitreous, with all its dangers and disadvantages. One should be constantly on guard to detect the first sign of vitreous prolapse and act promptly to anticipate it and to limit its extent.

Why is a vitreous prolapse dreaded? One hears it said that a small loss does not matter and that the eyes really seem to do best when some vitreous is lost. That is surely not the case. The accident is one to be carefully guarded against, limited as much as possible and always dreaded. The disadvantages are that it always means a rupture of the protecting hyaloid membrane and the opening of the vitreous body to infection or less serious inflammation, with the possibility of opacities, either "floaters" or bands and webs, that may affect the visual result. The wound gapes more or less and heals slowly and the resulting astigmatism is often increased. Inflammatory action, often as severe and serious as an iridocyclitis, may be the result, and the final outcome disastrous. Secondary glaucoma, possibly due to the mixture of vitreous with the aqueous and a retarding effect on the exit of the intra-ocular fluids, is by no means uncommon. Less unfortunate results are adhesion of the edges of the cut iris to the wound, and cystoid scars.

It is hardly possible to mention a single outstanding cause of loss of vitreous during cataract extraction. It should be thought of as a possible complication in every case, and as something that may occur at any time during the operation after the corneal incision is completed. Doubtless every operator has had the unfortunate experience of seeing all of the intra-ocular contents follow the knife blade in its exit from the wound. Such an incident causes a most calamitous form of vitreous loss, whether accompanied by a large choroidal hemorrhage or not. From this extreme to the other, namely, the appearance of a small vitreous bead in the lips of the wound, which subsides when the pressure of the lids and extra-ocular muscles is removed, all variations are possible. They are undesirable in any degree, though not always harmful as far as the ultimate visual result is concerned unless the loss is great.

* Read before the Section on Ophthalmology at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 15, 1928.

The predisposing causes of vitreous prolapse are many, including the general health of the patient, the blood pressure and especially his nervous equilibrium and control. The immediate and exciting causes are the fluidity of the vitreous body itself and the pressure on the vitreous from within, from an intra-ocular hemorrhage, or from pressure on the ball, whether by the operator, or by the muscular action of the lids, or by contraction of the extra-ocular muscles. The causes of these, in turn, may be many, but the majority are fortunately more or less under the control of the operator.

One hears a good deal about the greater likelihood of vitreous loss in cases of fluid vitreous; and, while the consistency of the vitreous doubtless varies, I have not been able to find out how one can tell, in an eye with a mature cataract, just what is the consistency of the vitreous. It is better to consider all cases as those in which loss of vitreous is apt to occur.

The percentage of cases showing vitreous loss may be seen from the following analysis of my own cases: In a series of about 600 consecutive cataract extractions, 7.6 per cent of the cases showed loss of vitreous, distributed as follows: thirty-four cases of small loss; fifteen cases of moderate loss, and three cases of excessive or large loss. This is about the average result. In 1,421 cases reported to this section in 1921, Parker had 10 per cent, and in a later series of 300 cases reported by him in 1927, 4 per cent showing vitreous loss. Dunphy reported to this section last year 8.3 per cent of vitreous loss in 2,560 cases studied at the Massachusetts Eye and Ear Infirmary. In the reports other than my own, the cases were not divided according to the amount of vitreous which escaped. The paper presented by Dunphy last year was based on a very large number of cases, and his conclusion was that it was a serious matter as far as the visual result is concerned. In fifty cases, the average vision was 20/56, besides six cases of total visual loss. He makes the interesting statement that since 1920, when lid and orbital infiltration became the common if not routine practice, the percentage of vitreous loss has been only about one-half what it was before that technic was followed. He further refers to a series reported by Dr. George Derby, in which deep orbital and lid injections and corneal sutures were used, with 2 per cent vitreous loss.

To return to my own small series, the following figures are interesting as showing the effect on the visual result of the loss of vitreous: In thirty-four cases, the loss is recorded as "small." In these the visual results were: 20/20, twelve cases; 20/30, seven cases; 20/40, three cases; 20/60, six cases; 20/80, one case; 20/100, two cases. The vision was less than 20/100 in three cases. That is to say, nearly 10 per cent were failures.

In fifteen cases in which moderate vitreous loss was recorded, there was vision of 20/20 in five; 20/30 in three; 20/40 in three; 20/60 in one, and less than 20/100 in three, or 20 per cent of failures. In the three cases showing a large loss, two eyes were enucleated, the third showing finally 20/70 vision; that is, there was 66 per cent of failures.

The astigmatism is an important factor, not only in the visual result but in the practical service which the eye gives with glasses. In the thirty-four "small loss" cases, it varied from 0 to 6 diopters, with an average of 2.9. In the fifteen "moderate loss" cases, it varied from 0 to 10 diopters, with an average of 3.5. In the "large loss" case in which the eye was not lost, the astigmatism was 4 diopters.

The prevention of vitreous prolapse is the reward, and in part the object, of every step in the preparation of the patient and the performance of the operation itself. Some things are of greater importance than others in this respect, and one of the most important is to bring the patient to the operating table in the best possible physical and mental condition. This would take into account the evacuation of the bowels some time (two or three hours) before the operation, the evacuation of the bladder immediately before, as quiet and restful a night's sleep as possible, a sedative if necessary, and the reduction to an irreducible minimum of all unnecessary noise, bustling and talking that would disturb the patient. If a comfortable operating table could be devised, it would be a great help. Most of them are very hard and very narrow, and the sojourn thereon, even for a short time, does not add to the repose of either body or mind. Once in the operating room, the less said to the patient the better, and that should be said by the operator and the one who does the preparation. All that is said should be quietly and kindly said, to promote confidence and repose of the patient's mind. He should be reassured as to pain and all the other things he is probably dreading. In March, 1921, in a letter to the *American Journal of Ophthalmology*, I stated that the factors to be observed to insure a successful cataract operation were:

1. Complete anesthesia, usually local anesthesia, with the addition of a subconjunctival injection of an anesthetic.
2. Quiet in the operating room.
3. Relaxation of the patient, the best single means to that end being to make him open the other eye.
4. A large corneal incision.
5. A free capsulotomy.
6. A careful toilet of the wound.

With the exception of the last item, all of these are the things one should do to avoid the escape of vitreous. Most important of all is the anesthesia. The majority of cataract operations are, of course, done under local anesthesia, and more operations fail from lack of sufficient anesthesia than from any other one cause. It is hardly in the province of this paper to discuss the method of producing anesthesia, but a reliable drug in potent strength should be used, and sufficient time given for it to take effect. To the instillations I myself add the subconjunctival injection of an anesthetic, in which procedure I have great confidence.

If the patient is at all inclined to "squeeze," the orbicularis muscle should be paralyzed by the method of Van Lint or some of its modifications. If the patient is one who will not look down, the superior rectus should be put out of commission by the same means. Many operators use the orbicularis injection as a routine, and as some of them are present, it will be interesting to hear of its effect on the incidence of vitreous prolapse. As regards the operation itself, it should be quickly and quietly done with a minimum of fussing and needless delay. The patient should be under the direction of the operator alone, and no step should be taken that will hurt or otherwise disturb him without a word of warning quietly given. I think that if I had a phonograph record to repeat constantly "open the other eye," and "look down," it would cover every conversational requirement during a cataract operation.

Escape of the vitreous will depend on whether or not the lens has been delivered. In any case it is well

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to remove the speculum or retractors and let the patient close the eyes and relax. If the lens has not been delivered, pressure to expel it will almost surely cause further vitreous loss, so that the extraction of the lens by the loop is usually necessary. Then the eye should be closed and dressed, with such smoothing out of the conjunctival flap and other manipulation as can be done without causing the loss of more vitreous. If the lens is already delivered, it is best to allow the patient to close both eyes gently, breathe deeply and rest a moment. Inspection will often show that, with the relaxation that attends this performance, the protruding vitreous will return into the eye and the wound will close. If any vitreous protrudes from the wound it may be washed or cut off.

Lost vitreous is not regenerated but is apparently replaced by aqueous. This is the probable explanation of the fact that such small harm often follows a vitreous loss. In case the loss is so great that the ball collapses, it may be restored to its normal fulness at once by the injection of physiologic sodium chloride solution into the eyeball through the wound with a medicine dropper or by other means, as was suggested years ago by Andrews of Santa Barbara. This restores the normal contour of the ball at once, and I have practiced the method successfully; but I have also seen collapsed balls in which this was not done restored to their normal fulness in a day or two, presumably by being filled with aqueous, so I do not know whether it is necessary to do anything in such a case or not.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. KNAPP AND ELLETT

DR. ARTHUR J. BEDELL, Albany, N. Y.: When the master of a subject reports his experience there is very little for a discusser to say. Therefore, I will show a few pictures and call attention to the Scientific Exhibit, where these and others are shown stereoscopically. By the combined use of the slit lamp and camera we are able to follow and record our own experiences so that others may profit by the photographs. The first picture is that of a man who had been operated on ten times; the last operation was done ten years before this picture, which shows a wide white cortical ring, was taken. There was so much cortex that after the classic Ziegler operation the whole anterior chamber was filled with the mass. The importance of a clear conception of the capsular remnants is illustrated and the need of definite statements in relation to the time of convalescence emphasized. The second photograph shows the comparatively clear black pupil with an encircling cortical band, a Semmering ring. If the Ziegler capsulotomy is performed through the thinner parts of the capsule, healing is rapid and uneventful. The third picture presents a clear triangular opening through the capsule, such as Dr. Ziegler taught me to make. I wish to emphasize his technical points of a conjunctival puncture, the primary quick thrust and the sawing motion when cutting the capsule to avoid ciliary body traction. Dr. Knapp described his treatment of dense calcareous looking membranes at the last meeting of the American Ophthalmological Society in Washington. This white plaque was incised with difficulty but a clear opening was made and has been maintained. The point of entrance is a visible scar and a line of exudate fibers can be traced from the vitreous to it. This is an excellent reason for careful sterilization at the time of operation. The photograph of the frog spawn-like Elschnig spheres projecting into the aqueous again proved the advisability of making a double cut rather than the straight incision some one proposed a few years ago. Dr. Knapp's table of results proves the lessened efficiency of any but the inverted V incision and is the strongest plea for the Ziegler capsulotomy.

DR. WALTER R. PARKER, Detroit: Dr. Ellett has referred to the results obtained in two series of cases published by me, in the first of which, about 1,400 cases, th re was 10 per cent loss of vitreous, and in the last, 300 cases, there was 4 per cent loss. I though it might be interesting to try to determine why this last series showed so much better results. This decrease in loss from 10 to 4 per cent was not due to block anesthesia because a very small number of these cases were so treated, nor was it due to a conjunctival stitch because none was used. I shall try to suggest some details that were different in the last series from the first. To begin with, my first series contained every cataract operation I had performed up to the time of publication, in both private and clinical practice, and doubtless this experience led to improved technic throughout. I now have a trained assistant, which I believe to be essential. The speculum is removed before the capsule is opened, and the management of the lids is left to the assistant. The procedure, I believe, is more responsible for the diminution in the number of cases of vitreous loss than any other detail. Secondly, I pay much more attention to the question of anesthesia. It has been my habit for the last three or four years, after cocaine has been instilled and the speculum introduced, to drop on the cornea a 2 per cent solution of phenacaine. If the anesthesia is not complete, the patient will complain of smarting; in that event a few more drops of phenacaine are instilled until the patient is no longer conscious of the presence of phenacaine. That may not be the best method, but it will indicate when the patient is under the anesthetic. Procaine was injected in a few cases but not as a routine procedure. Thirdly, the mental state of the patient has been considered more carefully. By close attention one can determine when the patient is mentally under control. If the patients are not relaxed, we do not operate. It is much better to postpone the operation to another day. If the patient is still not under control, it is best to give a general anesthetic. It takes much more courage to postpone an operation than to proceed with it. In regard to the amount of irrigation, while I hope to have irrigation in every case, if there is an impending vitreous loss it may be better to have a slow convalescence, with some cortical matter left in, than to attempt to remove it all with the prospect of extensive vitreous loss. The absence of vitreous loss, however, is not the essential factor in cataract extraction. The important thing is to get the cortical matter out with as little injury as possible.

DR. JOHN O. MCREYNOLDS, Dallas, Texas: The excellent analysis as to the cause of vitreous loss, and the measures of prevention as presented by Dr. Ellett, cannot be too highly commended. And yet, in some cases, I must confess that the loss of vitreous seems inevitable. The resistance offered by the anterior hyaloid membrane and the degree of vitreous tension are exceedingly variable factors. A careful study of each individual case in advance of the operation will be of value in estimating the probability of such an occurrence. If the condition is such as to warrant much apprehension, we may avoid this complication many times by observing the following precautions, applicable particularly in cases of cataract associated with glaucoma: The preliminary incision can be made so as to include an arc of about one third of the circumference of the limbus circle, instead of making a full incision at the beginning. A small conjunctival flap 6 mm. in width should be made; then the lids should be allowed to close gently so the eye can rest and become adjusted to the changed conditions. In such cases I think a lid elevator should be used instead of a speculum. A conjunctival suture can be introduced and looped, but not tied. Then, after a little rest, the incision can be extended laterally on either side by means of scissors. The lens can then be delivered and the suture immediately tied before the pillars of the coloboma are replaced. This procedure I have used successfully many times when it seemed that the vitreous would surely be lost in large quantities.

DR. S. B. MUNCASTER, Washington, D. C.: The fear of loss of vitreous has been less with me since I have been dissecting with scissors a crescent shaped conjunctival flap previous to making any sclerocorneal incision, always with a new cataract knife. A subconjunctival injection is made on each side of the eyeball with a solution of procaine and epinephrine, and in nervous patients an injection is made into the

temple. Before the patient comes to the operating table I use a 2 per cent solution of butyn, three times, every five minutes, and then, while the procaine is having its effect, I make the conjunctival flap, crescent-shaped, about half the size of Elliott's trephine flap, the ends of the crescent coming almost to the point at which the incision is made with the knife. The incision is made under the flap. Just before the knife comes out the assistant raises the flap with forceps so that I can see exactly the place to finish the incision. It is not necessary, but it is safer, to use a suture, as the flap can be easily adjusted in the proper place. I always use capsule forceps in cataract operations.

DR. ALLEN GREENWOOD, Boston: I wish to discuss Dr. Ellett's paper from the standpoint of prevention of loss of vitreous by complete anesthesia, negative pressure, and especially the use of a cataract knife made as keen as possible, so that in making the incision across the eyeball the eye will not be dragged from side to side. All tendency to push and pull the eye with fixation forceps must be avoided. I want to second Dr. Parker's suggestion as to the use of phenacaine. I have not done a cataract operation in recent years that I have not supplemented the cocaine with a drop or two of phenacaine at the time of operation.

DR. GEORGE S. DERBY, Boston: Two years ago I reported a series of 200 cataract extractions done in my service at the Eye and Ear Infirmary in Boston by six or seven operators. Out of the 200 cases, there was vitreous loss in only four. I think that was entirely due to the methods employed in the series. The first point in the technic was the injection of the lids; the second, getting absolutely perfect anesthesia, usually by means of the orbital injection of procaine, which I think gives better anesthesia than any other procedure, and the third, the use of a small conjunctival stitch, a small flap of the conjunctiva being fastened into the limbus and clamped down. That conjunctival stitch I know will prevent a certain amount of separation of the wound, or prolapse of the iris and loss of vitreous.

DR. JOHN E. WEEKS, New York: In considering the subject of conjunctival stitch it might be well to note what men of large experience have done and are doing. The late Dr. Hermann Knapp seldom used a conjunctival stitch. Morax uses a conjunctival stitch, not as a routine but from time to time only. Kalt uses a corneal stitch a great deal, but not always. Coppinger operates generally without a conjunctival stitch. Collins uses a conjunctival stitch very seldom. Schweiger, operating years ago, did not use a conjunctival stitch, nor did Hirschberg. Ischikawa usually operates without a conjunctival stitch. Komoto, the dean of ophthalmology in Tokyo, does not use a conjunctival stitch. Lagrange and Ukthoff seldom used the conjunctival stitch. Reese did not use the conjunctival stitch. In my own operations I have seldom used the conjunctival stitch. In regard to the treatment of the capsule, the late Dr. Hermann Knapp in doing a capsulotomy made a long curved incision, with the concavity downward, in the upper third of the anterior portion of the capsule, supplementing it at times by a T shaped incision. I followed that plan for a long time, but I had to do a secondary operation in from 50 to 75 per cent of the cases. I now use capsule forceps and take away a certain portion of the anterior portion of the capsule. After this method I have to do a secondary operation in perhaps from 10 to 12 per cent of the cases. Following the use of capsule forceps one may get an incarceration of the capsule, but this seldom occurs. If the anterior chamber is not restored fairly soon after the operation one may be sure that a shred of capsule is incarcerated in the wound which is permitting escape of the aqueous. It may be a week or ten days or even longer before there is sufficient healing to produce restoration.

DR. LLOYD MILLS, Los Angeles: May I suggest that the records of the gentlemen whom Dr. Weeks has just mentioned might have been susceptible of improvement had sutures been used as a routine? In regard to the treatment of prolapse of the vitreous, if horizontal sutures are placed at the angle of incision and there is a tendency to prolapse, the tying of these sutures immediately will cause retraction and one may proceed with the operation in safety and usually without further trouble.

FACTORS OF SAFETY IN OPERATIONS FOR CARCINOMA OF THE COLON *

WALTER E. SISTRUNK, M.D.
ROCHESTER, MINN.

Since the introduction of asepsis, the mortality following intra-abdominal operations has gradually diminished, but it is still high following operations for carcinoma of the colon. Except for operations in certain serious emergency cases, the mortality following such operations is perhaps higher than in any other type of intra-abdominal operation.

Since, however, surgery offers the only known cure for carcinoma of the colon and since the results are in many cases highly satisfactory, it would appear that the present mortality must be accepted.

Any surgeon performing this type of operation should bear in mind certain general facts as follows: (1) This portion of the intestines contains large numbers of bacteria of a more virulent type than those in the upper intestinal tract; (2) all carcinomas of the colon which are palpable before operation, especially those associated with partial or complete obstruction, are infected with virulent organisms which also often have invaded the tissues for a considerable distance beyond the original growth; (3) the majority of patients with carcinoma of the colon seek medical aid after partial or complete obstruction has developed and radical operations in the presence of even partial obstruction are far more dangerous than similar operations if obstruction does not exist, and (4) the walls of the colon are thin and the blood supply less plentiful than in the upper intestinal tract and for these reasons satisfactory healing of the walls of the bowel following operation is less rapid than in the upper intestinal tract.

For several years I have attempted to develop a technic which would lower the mortality in this type of case. Careful study of the cause of death following operations for carcinoma of the colon has led me to believe that any of a number of factors may be responsible for the mortality. I have concluded that the following factors are highly important and should receive careful consideration in operations for carcinoma of the colon.

SELECTION OF PATIENTS FOR OPERATION

No doubt many of the deaths follow radical operations performed when the growths are too advanced for such operations and in cases in which operations are performed in the presence of obstruction. From a humane standpoint, patients with obstruction must be operated on regardless of the risk. Young patients with removable growths should always be given the advantage of an operation even though the growths are extensive and the risk high, provided evidence of distant metastasis cannot be found and it seems possible to remove all the grossly involved tissue. Experience shows that a high mortality follows operations performed on elderly patients when the disease has been present for a long time and when marked cachexia, anemia and loss of weight and strength are evident. It is in this group that the judgment used in the selection of patients for operations greatly influences the mortality.

* From the Division of Surgery, Mayo Clinic.
* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 15, 1928.

PREPARATION OF PATIENTS FOR OPERATION

If patients are properly prepared for operation there apparently is less danger of fatal peritonitis from gross soiling with liquid feces during the operation. Patients who do not have obstruction are best prepared by the administration of a dose of castor oil several days before the operation and by enemas two or three times a day after the oil has acted satisfactorily. After the oil has been administered, the patients are kept on liquids, sugars and fruit juices and are encouraged to take large amounts of water, tea with lemon and sugar, ginger ale, lemonade, orangeade, candy and sugars. All proteins are withheld. For twenty-four hours before the operation the enemas are discontinued and a teaspoonful of camphorated tincture of opium is given every three or four hours to diminish the intestinal juices and to produce constipation. When patients are thus prepared, the intestines are usually found at operation to be empty or to contain solid fecal matter which may be easily wiped away, with a minimal amount of soiling.

On account of the danger of producing acute obstruction in cases of partial obstruction, purgatives are not given. Such patients are usually prepared by the administration of liquid petrolatum by mouth and by frequent enemas for three or four days before the operation. During this period only liquids, fruit juices and sugars are given. Camphorated tincture of opium is administered for twenty-four hours before the operation. If acute obstruction exists, nothing is gained by preoperative preparation and an early operation for relief of the obstruction offers the patient the best chance.

IMMUNIZATION OF PATIENTS

Hermann of the Mayo Foundation has shown that it is possible to immunize animals against fatal peritonitis to a certain extent by the use of vaccines made from feces. Because of Hermann's work and of similar observations by Draper of New York, vaccines made from cultures taken from patients who have died of peritonitis are administered before operation. Although the results obtained so far have been very encouraging, its full worth has not been definitely determined.

TECHNICAL FACTORS

Anesthesia.—From experience in the clinic it would seem that very light general anesthesia, local anesthesia combined with light general anesthesia, or spinal anesthesia is safer than deep general anesthesia. The anesthetic probably plays a part in the mortality in certain cases, particularly in cases of acute obstruction and if patients are elderly and in poor physical condition; in such cases every effort is made to avoid a general anesthetic.

Operations by Stages.—Results show that radical operations for carcinoma of the colon are more safely performed in stages. Patients often appear better able to stand several short operations than a single long one. If operation is performed in stages, obstruction is relieved and the bowel containing the growth is placed at rest. This apparently tends to diminish the virulence of the organisms in the growth and tissues adjacent to it. Many patients are subjected first to a preliminary operation, such as appendicostomy, enterostomy, colostomy or a short-circuiting operation.

Trauma.—I believe that many of the deaths which result from peritonitis are due to trauma to infected tissues during the operation. Trauma causes an exudate from the infected tissues surrounding the growth and it is probable that virulent organisms contained in such an exudate may be poured into the peritoneal cavity and produce fatal peritonitis. Every effort should be made to avoid undue trauma in operating.

POSTOPERATIVE TREATMENT

I consider the postoperative treatment highly important. Experience has shown that when patients are allowed to take fluids by mouth immediately following the operation, the intestines are likely to become distended with gas. In such an event, it may become necessary to administer enemas to relieve the distention. As the wall of the colon is thin and the blood supply poor, it is very easy for such distention to cause leakage along the suture line. In order to avoid this, patients on whom radical operations have been performed are treated as though peritonitis were known to exist from the time of the operation; all fluids by mouth and by rectum are withheld for three and a half or four days. During this period, morphine is administered freely for thirty-six or forty-eight hours to diminish peristalsis, and from 2,000 to 2,500 cc. of physiologic solution of sodium chloride is given subcutaneously every twenty-four hours. After forty-eight hours codeine in one-half grain (32 mg.) doses is given every three or four hours. A rectal tube is introduced several times a day. After three or four days, if gas is being expelled by rectum, water is given by mouth; later tea and orange juice, and then broths are given, but semisolid and solid foods are withheld for at least six days. Should the patient fail to expel gas after three and a half or four days, glycerin suppositories are used and if these are ineffectual in aiding in the expulsion of gas, small enemas consisting of 60 cc. of glycerin and 60 cc. of water are given until the gas is expelled. Nothing is administered by mouth until gas is being freely expelled by rectum. Most patients who expel gas early and who have little distention during convalescence survive the operation.

Postoperative treatment of the foregoing type reduces to a minimum the possibility of distention of the bowel with gas, and by preventing this and diminishing peristalsis more rapid healing of the wall of the bowel undoubtedly takes place and prevents spread of the localized peritonitis which must occur in all such cases. The use of these methods seems to aid in reducing the mortality in this type of work, but even when every known factor of safety is used there still remains a high surgical risk.

Specializing Too Early.—One of the besetting sins of the present age is hurry, and if a man specializes too early he is apt to cultivate his own department to the neglect of others. An exclusive interest of this kind leads to narrow and distorted views whereby the part is magnified out of all true proportion to the whole, while concentration of thought along a single line interferes in many cases with the ability to take a comprehensive view of the whole morbid process. The "young man in a hurry" who thinks he knows all about his special subject runs a great risk of being a danger both to himself and to the community among whom he practices. His enthusiasm, so praiseworthy in itself, stands in need of direction and can only lead to disaster if permitted to have full scope within the narrow and cramping boundaries of his specialty. It follows, therefore, that although the specialist may devise some new form of local treatment, or improve methods of operative technic, there is a risk of his doing so without regard to the broad principles which underlie all rational therapeutics.—Ramsay, A. M.: *Glasgow M. J.*, November, 1928.

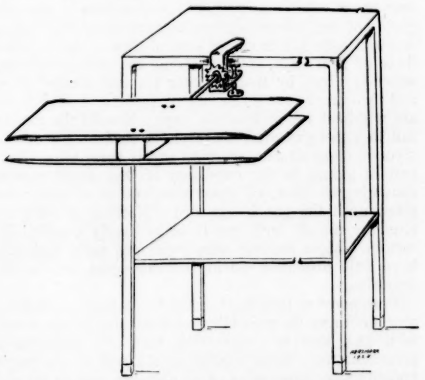
Clinical Notes, Suggestions and New Instruments

A NEW DEVICE FOR FACILITATING THE PREPARATION OF PLASTER-OF-PARIS REINFORCEMENTS *

MAURICE H. HERZMARK, M.D., NEW YORK
Senior House Officer, Hospital for the Ruptured and Crippled

Plaster-of-paris reinforcements are used to strengthen plaster bandages at points of stress, such as the larger joints, or where unusual durability is needed, as in foot bandages when walking is to be permitted. These reinforcing strips are usually prepared by rolling out a plaster-of-paris bandage on a smooth board to a suitable length and then folding it back on itself in a reverse direction and rolling it back to the point of starting. By continuing this process of folding the bandage back or reversing at each end, successive thicknesses are superimposed one on the other until an eight or nine ply strip has been made.

This method of making "reverses" or reinforcing strips has several disadvantages. It is slow; the folding back process makes handling awkward and results in wrinkling; only one at a time can be made by an operator, and satisfactory work can be done only after considerable practice.



Device for making plaster-of-paris reinforcements. The device has been drawn out of proportion to the table to avoid giving too much space to the table, and to bring out the details of the ratchet mechanism.

To overcome these disadvantages, I have designed a device that can be easily made and fastened to a table or sink convenient for the operator or his assistants. This device is made of two pieces of board 5 inches wide, 14 inches long and one-half inch thick rounded down to about one-fourth inch at the ends, and fastened together in the center by a block of wood 1½ inches thick, 2 inches wide and 5 inches long. These two boards, held together by the central block, are mounted on a large clamp by means of a metal rod which is attached to a ratchet. The ratchet allows turning to the left but fixes the boards in a horizontal plane when pressure is made on the right. This was designed for the purpose of turning the boards a complete revolution to the left as the bandage is unwound from left to right and yet permitting the smoothing out of the layers in a horizontal plane.

The bandage is started at the left and rolled out on the upper board, which is held in a horizontal position. When the right edge is reached, the boards are turned to the left a complete turn, thus permitting the bandage to be wound around the upper and lower boards. When the bandage has been unrolled in this manner the layers are smoothed out, and the reinforcement is removed by cutting between the two boards at the ends. If a long reinforcement is needed, only one end is cut; by cutting at both ends, two short reinforcing strips are obtained.

This device eliminates the need for folding back or reversing in the making of plaster-of-paris reinforcements; it permits of rapid action; it is easy to make and easy to handle; it will make two reinforcements at one time, and the strips made with it are smooth and even.

As an aid to the making of efficacious plaster-of-paris bandages, I believe that this device has a worthy place in the armamentarium of the surgeon.

321 East Forty-Second Street.

* From the service of Dr. Royal Whitman.

NARCOLEPSY

E. C. THRASH, M.D., AND J. C. MASSEE, M.D., ATLANTA, GA.

Narcolepsy is a clear-cut syndrome characterized by paroxysmal attacks of sleep. Associated with narcolepsy there are usually cataleptic seizures. The attacks of sleep are peculiar in that they come on frequently during the day, are irresistible, and may not be relieved by normal sleep at night. The patient may dream during attacks, may be aroused as from normal sleep, and may feel refreshed on awakening. The cataplectic seizures, which are intimately associated with narcolepsy, are characterized by complete loss of voluntary movement and muscle tonus, usually as the result of great emotional stimulus, particularly laughter. Consciousness, however, is not lost in cataplexy.

Recently Wilson[1] summarized the present knowledge of narcolepsy and collected reports of forty-three cases from the literature. His bibliography covers the literature on the subject. There have been very few cases reported in America, however, and it is simply to add further observations in an American case that this report is made. Our case is interesting in that there was a definite suggestion of pituitary dystrophy, as has been noted in other cases, and the narcoleptic and cataplectic symptoms seemed definitely to have begun following injury to the head, as has also been noted in a large percentage of the cases reported by others. The fact that the condition went on for ten years without being diagnosed, although the patient was studied in several clinics, points to the need for calling attention to this syndrome.

In Wilson's collected series of cases the etiologic factors suggested by the various authors were approximately as follows:

1. Traumatic group.
2. Psychopathologic group.
3. Endocrine group.
4. Epileptic group.
5. Toxic-infective group (epidemic encephalitis).
6. Circulatory group.
7. Pressure group (cerebral tumors).
8. Group in which no underlying pathologic condition has been discovered.

The pathologic background so far has not been satisfactorily determined. While pituitary disturbances have been thought to have some bearing on the malady, sufficient data have not been obtained to enable us to determine definitely that this organ has any direct rôle in producing the disorder. Disturbances of the structures in the vicinity of the floor of the third ventricle have been thought by some to be the cause of narcolepsy, but the only basis for this opinion is that the subcortical sleep centers are in this area.

REPORT OF CASE

History.—A negro, aged 35, a boilermaker's helper, complained of weakness, tremulousness, and loss of voluntary control of the muscles whenever he received a sudden order from his boss or was under any great emotional stress. He was apparently well until 1918, when he suffered a fracture of the nose and superior maxilla in a railroad wreck in France. Following this he was in the hospital for about a month and slept a good deal. Afterward he noticed that when his boss gave him a sudden order or when he was in any excitement he became subject to queer sensations of weakness and tremulousness of all his muscles. The sensations were more severe at times than others. Occasionally, he would be able to reach a chair and sit down; otherwise he would fall to the ground, limp and

1. Wilson, S. A. K.: Brain **51**: 63-109 (March) 1928.

unable to move, although perfectly conscious. On one occasion he knocked out his lower front teeth and he stated that he frequently hurt himself in these falls. He could not work on a scaffolding for this reason, and any instrument or tool which he was grasping fell from his hands during an attack. It was impossible for him to stay in a group in which laughing and joking were going on, as he became helpless when laughing. There seemed to be a slight aura to the attacks, as he was often able to tell that one was coming on and could reach a chair or support of some sort before he fell. More recently these attacks had been brought on by trying to read, although there were no visual disturbances except for involuntary movements of the eyes.

Soon after the accident in France the patient noticed that he frequently felt an overpowering drowsiness and would drop off into a short sleep many times during the day. These moments of unconsciousness resembled normal sleep in every way except that they came on frequently during the day and overpowered him regardless of what he was doing. He had gone to sleep while walking, talking, eating, and even while driving his car. Once he awakened just in time to prevent a collision. Another time a cataplectic seizure was produced by the fright of seeing a schoolgirl step in front of his car. He was able to put on the brakes before he lost power to move and crumpled onto the steering wheel. He was easily awakened from these lapses and felt as refreshed as on awakening from normal sleep. At times his repose was interrupted at night, but even ten hours or more of sleep did not protect him from narcoleptic and cataplectic attacks.

Since his discharge from the army the patient had been treated in numerous government and other hospitals but had not received any benefit.

The patient's father, mother, one brother and a sister were living and well. One brother died of tuberculosis; one sister died of an unknown cause. There was no family history of hereditary diseases. The father, mother and siblings were of normal size and development.

The patient had been married for eight years; his wife and four children were living and well. There had been one miscarriage.

The patient used coffee and tobacco moderately, and alcohol occasionally, but stated that he never used drugs.

The patient had had measles as a child and mumps in 1918. He had had gonorrhea in 1912, and a tonsillectomy had been performed in 1927. Apparently he developed normally, made normal intellectual progress, and finished the seventh grade in school. However, he thought that he had continued to grow until the present time and stated that he had never been able to wear more than three or four pairs of shoes of the same size but had had to increase the size of his shoes and hats periodically. During the past ten months he had increased from 220 pounds (91 Kg.), his usual weight, to 250 pounds (113 Kg.). There seemed to be a normal libido and sex development.

Physical Examination.—The patient was a huge, sleepy looking mulatto, who tended to drop off to sleep even while being examined and answered questions in a very drowsy way. The eyes and fundi were normal. The nose was normal. There were several dental bridges on the teeth and some pyorrhea was present. The patient was otherwise physically normal. The genitalia and pubic hair were normal. The extremities appeared normal in shape and the roentgenograms of the bones were normal.

The neurologic examination was negative.

Roentgen examination of the skull was negative.

The blood and spinal fluid were normal to Wassermann and routine tests, except that there was a moderately high sugar tolerance. The fasting blood sugar was 138 mg. per hundred cubic centimeters, and 148 mg. in one hour, 170 mg. in two hours, and 194 mg. in three hours, after an injection of 100 Gm. of dextrose.

The urine was normal except for rare pus cells and hyaline casts. The basal metabolic rate was 124. The patient's height was 77 inches; the torso measured 37½ inches, and the leg length, 39½ inches with a span of 84 inches.

157 Forrest Avenue, Northeast.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY OF THE AMERICAN MEDICAL ASSOCIATION HAS APPROVED THE FOLLOWING DEFINITIONS.

H. J. HOLMQUEST, Secretary.

ALTERNATING CURRENT. A current which periodically flows in opposite directions. Alternating current waves may be either sinusoidal or nonsinusoidal. The alternating current wave used most commonly therapeutically is the sinusoidal. Its variations in strength in either direction are the same; i. e., starting from zero it rises with a gradual increase in voltage and amperage until a certain maximum is reached, when, without any pause or break, it decreases in the same gradual manner until the zero line is again attained; then, still without pause, the same process is repeated with equal intensity but in the opposite direction. This constitutes one cycle; one cycle equals two alternations. Furthermore, the cycle follows a definite law, the intensity of the current at any point being proportional to the sine of the angular displacement.

AMMETER. An instrument calibrated to read in amperes the strength of a current flowing in a circuit. For medical purposes the ampere is too large a unit; hence, it is divided into a thousand parts or *milliamperes*. A meter calibrated to read in milliamperes is called a milliammeter.

AMPERAGE. Strength of the electrical current expressed in amperes or milliamperes.

AMPERE. The unit of the rate of transfer of electricity. The international ampere is the unvarying electrical current which, when passed through a solution of silver nitrate in accordance with certain specifications, deposits silver at the rate of 0.001118 Gm. per second.

ANGSTROM UNIT. An internationally adopted unit of measurement of wavelength. It is one ten-millionth of a millimeter, or one two hundred and fifty-four millionth inch. For example, the shortest wavelength of ultraviolet energy from the sun transmitted by the atmosphere is not less than approximately twenty-nine hundred angstrom units. (See Light, Radiation Frequency.)

ANION. (See ion.) An ion carrying a negative charge. Since unlike forms of electricity attract each other, the ion is attracted by, and travels to, the positive anode. Examples are acid radicals and corresponding radicals of their salts.

ANODE. The positive pole of an electrical source. It should be noted that only the galvanic (direct current) and static electricity have distinct polarity.

ATOM. The smallest particle of an element that can exist alone or in combination with like atoms or with atoms of other elements. Some 90 odd different atoms have been recognized, which in combination with one another or others like themselves make up all the various types of material that we know. These atoms are no longer believed to be fundamental entities, being themselves composed of still smaller particles called electrons and protons. Dimensions of atoms are of the order of 10^{-8} centimeters. (See Electron Theory.)

AUTOCONDENSATION. A method of applying high frequency currents for therapeutic purposes. The treatment is administered as follows: One terminal of the high frequency generator is connected to a long metal plate. Over this strip of metal is placed a cushion, which serves as a dielectric, its thickness depending on the voltage. The dielectric may be a thin sheet of fiber or bakelite, or it may be a mattress stuffed with hair or silk floss several inches thick. The patient, sitting or lying on the cushion, generally holds in his hands a metal bar which is connected to the other terminal. This is analogous to the construction of a Leyden jar, the metal strip corresponding to the inner coating or tin foil of the jar; the glass dielectric to the mattress or fiber pad; and the patient to the outer coating of the jar. Hence it will be seen that this condenser, of which the patient is one plate, is alternately and with great rapidity charged and discharged, first positively and then negatively.

AUTOCONDUCTION. A method, formerly much in vogue in France, of administering high frequency currents. The patient stood or sat inside a large solenoid, the ends of which were connected to the two terminals of a high frequency generator. The high frequency current flowing through the solenoid generated a rapidly alternating magnetic field. This alternating magnetic field induced high frequency eddy currents in the patient.

AUTOTRANSFORMER. A transformer that has part of its turns common to both primary and secondary circuits. (See Transformer.)

BASES. Compounds of an alkaline character in solution, capable of reacting with acids to form salts and water; specifically the hydroxide of a positive element or radical.

BIPOLAR. The use of two poles in electrotherapeutic treatments. When referring to an alternating current, biterminal should be used.

BITERMINAL. See Bipolar.

BRUSH DISCHARGE. In electrotherapeutics, the discharge from a static machine (less commonly from a high frequency apparatus), having a disruptoconvective character and peculiarities that can be produced by the passage of an electrical current through a resistance such as a tube containing glycerin or a damp (or "green") wooden wand.

CAPACITY. The property by which a given body will take and hold an electrical charge. For units of capacity see Farad.

CATAPHORESIS. The transmission of electronegative bodies into the tissues by the passage of an electric current. The flow is toward the negative pole.

CATHODE. The negative pole, as opposed to the anode, or positive pole. (See Negative Pole, Positive Pole.)

CATHODE RAYS. Particles of negative electricity streaming from the surface of the cathode and away from it at right angles irrespective of the position of the anode. (See Electron.)

CATION. The name given by Faraday to the element or elements of an electrolyte which in electrochemical decomposition appears at the negative pole, or cathode.

CHOKE COIL. Coil of wire which may or may not be provided with a movable laminated iron core, used to limit the flow of current in alternating current circuits. An electrical device using the inductive properties of the alternating current to limit or retard the current entering or leaving an apparatus.

CIRCUIT BREAKER. A safety device for opening an electrical circuit; a switch.

CLOSED CIRCUIT. A circuit through which electricity is passing or can pass.

CONDENSER. Any apparatus by which charges of electricity can be accumulated. It consists of two conducting surfaces separated by a nonconductor.

CONDUCTANCE. The conducting power of a body or a circuit for electricity. The best conductor is that which offers the least resistance. Examples of good conductors are gold, silver and copper. When expressed in figures, conductance is the reciprocal of resistance. The unit is the mho.

CONDUCTIVITY. The specific electric conducting power of a substance. Numerically, conductivity is the reciprocal of unit resistance, or resistivity. The unit is the mho per cm. Specific conductivity is sometimes expressed as a percentage. In such cases the conductivity is given as a percentage of the conductivity of pure copper under certain standard conditions.

CONVECTIVE DISCHARGES. Discharges from a high potential source in the form of visible or invisible streams of electrical energy passing through the air to the patient.

COULOMB. Unit of electrical quantity. It is the quantity of electricity transferred by one ampere in one second.

D'ARSONVAL DIRECT. See Diathermy.

D'ARSONVALIZATION. The employment of the d'Arsonval current in the form of autocondensation, autoconduction, or the direct biterminal method (diathermy).

DETONATING CHAMBER. A muffler surrounding the discharging balls of a static machine or resonator for deadening the sound of a spark discharge.

DIATHERMIA. An inferior term for diathermy. (See Diathermy).

DIATHERMY. A term employed to designate the use of a high frequency current to generate heat within some part of the body. The frequency (rate of oscillation or alternation) of the current ranges from approximately 750,000 to more than 3,000,000 oscillations per second. When such a current is passed through the body at a sufficient voltage and amperage, the resistance offered by the tissues intervening between the electrodes causes heat to be generated in such tissues. It was d'Arsonval who demonstrated that the passage of high frequency electrical currents through living tissues causes neither direct nor indirect contraction of muscles, but does cause the tissues to become heated. Nagelschmidt of Berlin, in 1907, apparently was the first to apply this property to human beings for therapeutic purposes, and to give it the name of diathermy—"heating through." The rise in temperature depends not only on the amount of energy absorbed but also on the efficiency of the circulation in carrying off the heat and maintaining normal temperature.

DIELECTRIC. An insulating substance which offers great resistance to the passage of electricity by conduction but through which electric force may act by induction. Examples are: the walls of a Leyden jar, the insulating cushion of an autocondensation couch, or an air space.

DIRECT CURRENT. A current that flows in one direction only. When used medically it is called the "galvanic" current. This current has distinct and important constant polarity and marked secondary chemical effects. (See Electrolysis.)

DIRECT VACUUM TUBE CURRENT. A current administered from one pole of a static machine, the other pole of which is grounded. It is regulated by the discharging spark-gap, and is applied by vacuum electrodes instead of the metal electrodes employed with the static wave current, which is administered in a similar manner.

DISRUPTIVE DISCHARGES. Electrical discharges usually taking place from a charged condenser and escaping suddenly.

DISRUPTOCONDUCTIVE DISCHARGES. The static brush discharge that simulates both the convective effluve and the disruptive or spark-discharge.

DRY HEAT. In contradistinction to moist heat. Sources of dry heat are the hot water bottle, the electric heating pad, and radiant heat lamps of various types.

EFFLUVE. A conductive discharge of a high potential current through a dielectric.

ELECTROCAUTERY. An apparatus for cauterizing tissue, consisting of a holder containing a platinum wire, which may be heated to a red or white heat by a current of electricity, either direct or alternating.

ELECTROCOAGULATION. Coagulation by means of a high frequency electric current. The heat producing the coagulation is generated within the tissue to be destroyed. By this method tissue can be destroyed to any desired depth.

ELECTRODESICCATION. See Fulguration.

ELECTRODE. A medium intervening between an electric conductor and the object to which the current is to be applied. In electrotherapy an electrode is an instrument with a point or a surface from which to discharge current to the body of a patient.

ELECTROLYSIS. The electrical decomposition of a chemical compound. Examples: the separation of an electrolyte into its constituent parts by a direct current; the removal of hair by the electrolytic effect of a direct current.

ELECTROLYTE. 1. A substance which in solution conducts an electric current and is decomposed by the passage of an electric current. 2. A solution which is a conductor of electricity.

ELECTROMOTIVE FORCE (Abbreviation, E. M. F.). That effect of difference of potential which, on the closing of a circuit, causes a flow of electricity from one place to another, giving rise to an electric current. The strength of an electric current is directly proportional to the impressed electromotive force, and inversely proportional to the resistance in the case of direct current and to the impedance in the case of alternating current. Electromotive force is measured in volts or in some convenient multiple or fraction of a volt. Microvolt, millivolt and kilovolt are, respectively, one-millionth volt, one-thousandth volt and 1,000 volts.

ELECTRON. An extremely minute corpuscle or charge of negative electricity; the smallest that is known to exist. The dimension of the electron is estimated as 10^{-13}, or $\frac{1}{10,000,000,000,000}$, centimeter.

ELECTRONEGATIVE. The condition of being subject to repulsion by bodies negatively electrified, and to attraction by bodies positively electrified.

ELECTROPHOROUS. An instrument for obtaining static electricity by means of induction.

ELECTROPOSITIVE. The condition of being subject to repulsion by bodies positively electrified, and to attraction by bodies negatively electrified.

ELECTRON THEORY. All bodies are composed of small particles called atoms, which are composed of still smaller particles called electrons and protons. Large amounts of energy are represented in the binding together of electrons and protons into atoms, and smaller amounts of energy in the binding together of different atoms as molecules. The latter energy of atomic combination becomes available during

chemical change. The former type, i. e., subatomic energy, is so far not accessible to experimental control. The nature and the atomic weight of the different chemical elements depend on the number of electrons and protons to the atom and on their arrangement. All bodies possess positive and negative electricity, usually present in equal amounts so that equilibrium is established and no electricity seems present. Charging a body consists in disturbing this equilibrium by taking away or adding a negative charge, or electron. When a stream of electrons flows through any substance there is an electric current. A negative charge results from an excess of electrons, a positive from a deficiency.

ELECTROTHERAPEUTICS. See Electrotherapy.

ELECTROTHERAPY. Treatment of disease by means of electricity.

ELECTROTHERAPEUTIST. See Electrotherapist.

ELECTROTHERAPIST. A medical graduate who has had special training and has acquired skill in the therapeutic use of electricity. The term is sometimes used incorrectly to designate any one who administers electrical treatments.

FARAD. A unit of electrical capacity. The capacity of a condenser which, charged with one coulomb, gives a difference of potential of one volt. This unit is so large that one-millionth part of it has been adopted as a practical unit called a microfarad.

FREQUENCY. The rate of oscillation or alternation in an alternating current circuit, in contradistinction to periodicity in the interruptions or regular variations of current in a direct current circuit. The frequency is computed on the basis of a complete cycle, a complete cycle being one in which the current rises from zero to a maximum, returns to zero, and rises to an opposite maximum and returns to zero again.

FULGURATION. "Destruction by flashing." This may be direct or indirect. *Direct:* An insulated fulguration electrode with a metal point is connected to the uniterminal of the high frequency apparatus and a spark of electricity is allowed to impinge on the area to be treated. This miniature arc may be long or short, cold or hot. In general, the shorter the arc the less the pain.

Indirect method: In this procedure the patient is connected directly by means of a metal handle to the uniterminal and the operator draws, by means of a lead pencil, an arc from the patient. This is less painful and its action is more superficial.

FUSE. A safety device comprising a strip or wire of easily fusible metal, the conductance of which is predetermined. The metal fuses and breaks the circuit when an excess of current passes through it. Convenient forms are mounted in plugs, or between hard metal ends confined under screw-heads.

GALVANIC CURRENT. See Direct Current. This current was first produced chemically from batteries. At present its sources are:

1. A direct current lighting or power circuit ("Main").
2. Alternating current circuit with introduction of:
   (*a*) Motor generator.
   (*b*) Rectifier.
   (*c*) "B-Battery" eliminator.
3. Battery of cells, dry or wet.

It should be remembered that the galvanic and so-called static currents are the only unidirectional currents and the only ones possessing constant polarity.

HIGH FREQUENCY. A current having a frequency of interruption or change of direction sufficiently high so that tetanic contractions are not set up when it is passed through living contractile tissues.

HOOK-UP. Used in speaking of the method of arranging circuits, appliances and electrodes in the giving of any particular treatment; as, for instance, the hook-up for direct sparks.

IMPEDANCE. The opposition to the flow of an alternating current which is the vector sum of ohmic resistance plus additional resistance, if any, due to induction, to capacity or to both. The resistance due to the inductive and condenser characteristics of a circuit is called reactance.

INDUCTANCE. That property of a circuit by virtue of which a magnetic field is associated with the circuit when the circuit is carrying current. It is susceptible of measurement. The unit of inductance, or "self-induction," is the henry.

INSULATION. The state in which the communication of electricity to other bodies is prevented by the interposition of a nonconductor; also, the material or substance which insulates. The electrical resistance of an insulator is for convenience expressed in megohms, a unit representing a million ohms.

(To be continued)

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, Secretary.

EPHEDRINE HYDROCHLORIDE-SWAN-MYERS

(See New and Nonofficial Remedies, 1928, p. 176).

The following dosage form has been accepted:

Syrup Ephedrine Hydrochloride (Double Strength)-Swan-Myers: Containing ephedrine hydrochloride-Swan-Myers, 0.4390 Gm., in 100 cc. (¼ grain per fluidrachm) and alcohol 12 per cent.

COD LIVER OIL-SQUIBB (See New and Nonofficial Remedies, 1928, p. 253).

The following dosage form has been accepted:

Squibb's Mint-Flavored Cod-Liver Oil: Cod Liver Oil-Squibb, containing 0.67 per cent of oil of spearmint as flavoring.

TETANUS ANTITOXIN, CONCENTRATED (See New and Nonofficial Remedies, 1928, p. 357).

H. K. Mulford Co., Philadelphia.

Tetanus Antitoxin (Bovine).—An antitoxin derived from the blood serum of cattle immunized against the toxin of *B. tetani.* Marketed in packages of one syringe (M-97) containing 1,500 units (one immunizing dose).

OVARIAN SUBSTANCE, DESICCATED-P. D. & CO. (See New and Nonofficial Remedies, 1928, p. 290).

The following dosage form has been accepted:

Capsules Ovarian Substance, Desiccated-P. D. & Co., 5 grains.

WHOLE OVARY-LEDERLE (See New and Nonofficial Remedies, 1928, p. 292).

The following dosage form has been accepted:

Tablets Whole Ovary-Lederle, 2½ grains.

ANTIRABIC VACCINE (See New and Nonofficial Remedies, 1928, p. 363).

The Gilliland Laboratories, Inc., Marietta, Pa.

Rabies Vaccine-Gilliland (Semple Method).—An antirabic vaccine prepared according to the general method of David Semple (phenol killed). The brain and cord of rabbits killed after inoculation with fixed rabies virus are emulsified in a ball mill, after which a sufficient quantity of physiologic solution of sodium chloride containing 1 per cent of phenol is added to yield an 8 per cent emulsion of the fixed virus. The emulsion is incubated at 37.5 C. for twenty-four hours and then diluted with an equal volume of physiologic solution of sodium chloride so that the finished product contains 4 per cent of the brain and cord substance in 0.5 per cent phenol. Marketed in packages of fourteen syringes each containing 2 cc. The content of a syringe is administered daily over a period of fourteen days.

ANTIPNEUMOCOCCUS SERUM (See New and Nonofficial Remedies, 1928, p. 360).

E. R. Squibb & Sons, New York.

Antipneumococcic Serum, Type I (see New and Nonofficial Remedies, 1928, p. 361).—Also marketed in packages of one 50 cc. gravity container.

ANTISTREPTOCOCCUS SERUM (See New and Nonofficial Remedies, 1928, p. 361).

E. R. Squibb & Sons, New York.

Antistreptococcic Serum-Squibb (see New and Nonofficial Remedies, 1928, p. 362).—Also marketed in packages of one 50 cc. gravity container.

The Filtrable Agent of Malignant Tumors.—That there is a filtrable agent concerned in the growth of malignant tumors of mammals has been indicated for the living animal by the work of Burrows and of Bisceglie. The former, working with rats, found in a small proportion of his attempts that rat embryo tissue of fifteen and sixteen days' development, comminuted and inserted into adult rats of the same descent after being immersed in the filtrate from the Jensen rat sarcoma, took the form of sarcomatous growth. In a much larger percentage there was evidence of stimulated proliferation without, however, the development of malignant tumor. Bisceglie carried on similar experiments with chick embryos of two to five days' development, which, comminuted and injected into adult chickens along with the filtrate from a mouse carcinoma, developed into sarcoma.—Eggers, H. E.: *Cancer Research,* September, 1928.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, DECEMBER 8, 1928

HEALTH APPEAL

The advertising writers of our progressive land have found that the word "IT" in their profession means "Health Appeal." A cursory inspection of current periodicals indicates no lessening of the attention to the health angle. The folly of the all-or-nothing policy in foods, the ridiculousness of some of the arguments as to vitamin content, the preposterous claims for glorified antiseptics, the cautious venturings of time-tried tonics into the public field, and the dazzling claims of the promoters of light arouse the risibilities of the physician by their startling inconsistencies if not by their exaggerations. Who would have thought ten years ago that cigarets would be sold to the American public not only by billboard displays of handsome damsels revealing unusual quantities of hosiery and epidermis, as they nonchalantly exhale streams of smoke from adenoidal nostrils, but actually by insistence on the healthful qualities of certain brands? Ah! brothers, we have come a long way in the passing decade!

In the periodicals for December the remarkable testimonial to the effect that Mrs. Whoozis, who could not even push the baby buggy, was able, after taking some yeast, to swim four times across the swimming pool at the country club, has given way to the assertion by Sir Arbuthnot Lane that yeast is what he thought the intestinal kink was ten years ago. The picture of Miss Rivergrove, Nevada, clad in a one-piece bathing-suit, who attained her present high state of pulchritude on a yeast diet, has given way, alas, to that of a heavily moustached Belgian professor who asserts, in a personal interview, that yeast is a marvelous laxative, or to that of a heavily bearded Teuton who has concealed himself behind his sage-brush so efficiently as to fail to realize that in America respectable physicians do not condone such public unveiling.

The growers of Japan tea, moved, no doubt, by the promotional efforts of the growers of coffee, assert in several popular publications that Japanese tea is the stuff to drink because it has vitamin C. Clever people, these Japanese! Nevertheless, Mattill and Pratt have concluded on the basis of scientific evidence that in everyday nutrition, despite its fairly high content of vitamin C, green tea has limited value as an antiscorbutic. "It cannot be used by children," they say, "and should not be used by adults to replace natural foodstuffs which meet additional nutritive requirements." The American advertising agency that promotes the Japan tea campaign was fully informed as to the lack of scientific evidence for the claims made, but presumably, like some other advertising agencies, it is more interested in linage than in evidence.

Fellow's Syrup, long the inhabitant of the pages of medical advertising mediums that do not follow the Council on Pharmacy and Chemistry, now begins to venture in popular periodicals, quite tentatively and modestly feeling its way, perhaps, before embarking largely in the "patent medicine" field.

Most startling of all the appeals are those having to do with body-weight. The promoter of an after-dinner tablet urges his wares and more food with the striking slogan, "I have said good-bye to indigestion: bigger and better lunches." But bigger lunches, hastily eaten, have worked havoc with the digestion of the American business man. That American womanhood passed, during the last five years, through one of those periodic crazes that have afflicted womankind since the world began is not a secret. Indeed, women everywhere began to cultivate sylphlike figures, dieted themselves to the point of destruction; and tuberculosis rates, particularly for young girls, rose in many communities. The inevitable result of the serious dieting was to lower the consumption of flour, sugar and other carbohydrates so greatly that persons engaged in those industries became alarmed. Today the millers, the sugar institute, the confectioners, and the manufacturers of cereals are purchasing advertising space to counteract what was for them commercially a serious situation, and what promised to be from the health angle a dangerous situation. Such institutional advertising as is being used by these industries is submitted, before release, to medical authority, and some effort is being made to keep the advertising matter within reasonable bounds. At the same time the manufacturers of Lucky Strike cigarets, having secured, they claim, statements from 20,679 physicians that Lucky Strikes were less irritating than other cigarets, are promulgating a campaign in which they assert that these cigarets do not cut the wind or impair the physical condition, and that "Lucky Strike satisfies the longing for things that make you fat without interfering with a normal appetite for healthful foods." To which the simple reply is made: "Hooey!"

Some women do eat too much; overweight can be controlled by proper dieting, no doubt in the majority of cases. Many people eat too much sugar and gorge on pastry! But the human appetite is a delicate mechanism and the attempt to urge that it be aborted or destroyed by the regular use of tobacco is essentially vicious. A statement by the advertising director of the

American Tobacco Company asserts that the production of cigarets this year will be more than double what it was ten years ago and that the use of cigarets has steadily increased in every year in the last fifteen. He cites among five reasons for the growth of his industry "increasing interest on the part of the medical profession in the social phenomenon of more widespread smoking, and the adoption of a more liberal attitude toward the cigarette and its effect upon the human body in the light of these improvements." That the medical attitude has become more liberal toward the smoking of cigarets cannot be gainsaid. There is, however, one aphorism in medicine that is as old as the science itself: "Moderation in all things." Unwarranted, exaggerated, unscientific and dangerous advertising campaigns are not the way to encourage a liberal attitude.

UNAPPRECIATED PATHS OF ABSORPTION IN THE BODY

The sound skin is notably resistant to the penetration of most chemical substances that do not injure the epidermis. This is, of course, a fortunate circumstance. Because of this factor the body is protected from a great variety of harmful agents with which it is almost inevitably brought into contact in its environment. The imperviousness of the skin is not, however, absolute. Certain volatile substances can penetrate the cutaneous barrier, though they are absorbed in that way much more slowly than by the lungs or the gastro-intestinal tract. Solutions of some substances in volatile solvents or fatty materials may also sometimes facilitate absorption through the skin, particularly as it is attempted in applications by inunction. The recognition of the resistance offered by the skin led long ago to the now obsolete endermic method of drug application in which epithelium was removed by a blister, and the remedy then applied to the exposed corium.

There are a few notable exceptions to the passage of foreign substances through the skin. Kahlenberg [1] discovered several years ago that boric acid is absorbed from its solution in compresses applied to the extremities. When salts of boric acid, such as sodium borate or lithium borate, are used, boric radicals are not found in the urine. It requires free boric acid to pass through the living skin. Why boric acid should possess this peculiar property of passing through the living skin while other substances, including salts of boric acid, are quite unable to penetrate, remains, according to Kahlenberg, to be discovered. He believes that this is a highly specific property of the acid. The solution of the latter probably is adsorbed by the skin (i. e., loosely combined with it), and from this loose combination the boric acid is swept away by the blood stream. In recent tests by Kahlenberg and Barwasser,[2] the remarkable observation was made that the time required for the absorption of boric acid by the skin and its elimination by the kidneys is only about fifty seconds.

The protective coverings of the organism represented by epithelial membranes more delicate than those of the skin are also often regarded as comparatively resistant to the passage of substances. However, the possibility of absorption of drugs through the buccal linings beneath the tongue and from the nasal and pharyngeal membranes is becoming better recognized. Some time ago Macht [3] of Baltimore demonstrated experimentally that all classes of drugs may easily be absorbed through the vaginal walls and in that way produce more or less severe cases of poisoning. He [4] has recently pointed out that the promiscuous and careless use of drugs in the form of vaginal douches and suppositories is still carried on not only by a reckless laity but also by many physicians. Macht adds that it is not sufficiently realized by such people that drugs applied ostensibly for their local effect may be absorbed into the circulation and produce systemic reactions. His studies dealing specifically with quinine bisulphate and oxyquinoline sulphate furnish evidence that these drugs can be absorbed, as might be expected, from the vaginal tract of animals when the compounds are instilled in aqueous solutions. There is a special significance in these observations in view of the fact that one of the compounds is recommended for use in fairly concentrated solutions (1:100) in vaginal douches. It is high time that the facts regarding the permeability of the readily approached protective membranes be adequately appreciated.

THE SIGNIFICANCE OF PARATHYROID HYPERPLASIA

The morphologic reactions and changes that can be brought about in various tissues through the influence of localized injuries or bacterial invasions have long been appreciated. In some instances purely mechanical influences may bring about the result; for the most part, however, it is more probable that the stimulus which initiates the consequent abnormality of structure is of a chemical nature. Thus, an injured tissue may liberate disintegration products that affect the cells which they reach; and micro-organisms may secrete chemical compounds that also initiate cellular responses in the structures exposed to the foreign agent. Only recently has come the realization, on the other hand, that lack of some essential for the welfare of a special tissue may also promote structural changes of moment in the body. A conspicuous instance is afforded by shortage of iodine leading to alterations in the thyroid gland. Active hyperplasia is likely to occur. According to Marine,[5] the iodine store of the gland varies,

1. Kahlenberg, L.: On the Passage of Boric Acid Through the Skin by Osmosis, J. Biol. Chem. **62**: 149 (Nov.) 1924.
2. Kahlenberg, L., and Barwasser, N.: On the Time of Absorption and Excretion of Boric Acid in Man, J. Biol. Chem. **79**: 405 (Oct.) 1928.
3. Macht, D. I.: J. Pharmacol. & Exper. Therap. **10**: 509 (Jan.) 1918.
4. Macht, D. I.: Concerning the Absorption of Quinine and Oxyquinoline Sulphate Through the Vagina, J. Pharmacol. & Exper. Therap. **34**: 137 (Oct.) 1928.
5. Marine, David: Functions of the Thyroid Gland, Physiol. Rev. **2**: 521 (Oct.) 1922.

in general, with the amount of stainable colloid, and inversely with the degree of active hyperplasia; and, in the extreme degrees of active hyperplasia seen in cretinoid states in man and animals, the iodine store may be entirely exhausted.

A similar relation seems to exist between the availability of calcium and phosphorus and the structural integrity of the parathyroid glands. These have been found to be exceptionally large in animals maintained on diets poor in calcium over long periods. Hyperplasia of the parathyroids has been described as an accompaniment of spontaneous rickets in which the metabolism of calcium and phosphorus is unquestionably upset. The now well established fact that the effect of unfavorable intakes of these elements may be favorably modified by adequate supplies of vitamin D or equivalent ultraviolet irradiation has naturally raised the question as to the possible influence of these factors on parathyroid welfare. An answer has been furnished by the extensive studies of Sheard and Higgins[6] at the Mayo Foundation. Chicks, a species particularly prone to develop rickets under unfavorable conditions, were maintained on identical diets in which the calcium content was adequate. The animals were kept within doors behind various window glasses that transmitted known portions of the sun's spectrum. Enlargement of the parathyroid gland was recognized within the first few weeks in chicks growing under amber and under blue glass; but the deviation from the normal was largely avoided when cod liver oil, which promotes the assimilation of calcium as ultraviolet rays do, was supplied in abundance in the ration. There was no organic indication in the content of either blood calcium or phosphorus, or in general activity that parathyroid hyperplasia had arisen. Indeed, this symptom of some deficiency appeared long before any manifestations of rickets or other osseous defects could be detected.

In these experiments the organism immediately responded to the lack of the lesser wavelengths of sunlight by the rapid increase in the number of parathyroid cells. For example, at the end of a month a chick grown in a blue glass pen without cod liver oil was found to possess a fused parathyroid nine times the size of the similarly located gland of a chick grown under vitaglass on exactly the same diet. The cells in the hyperplastic glands were not essentially different from those of the normal parathyroid. Higgins and Sheard concluded that the cells are functioning and that when the dietary or radiant conditions are unsuitable the secretory activity is accentuated so that the hormonal output of the parathyroids may be augmented. In the course of time, under this intensified functional effort, signs of injury arise. Regressive changes occur in the enlarged glands. According to the Rochester investigators, light appears to bear a definite relationship to the metabolism of the body associated with the physiology of the parathyroid glands. In the absence of the factors that the light represents, an attempt is made by the organism to compensate for the loss by an increase in the total functional activity of the parathyroid, as shown by its hyperplasia. A superabundance of the gland secretion seems to be adequate for the organism devoid of the optimal light factors, for there was no evidence of organic instability. The compensation is at best temporary, however. Presently the advantageous hyperplasia is attended with regression, with the breaking down of the cell cords, increase in fibroblastic tissue, and the frequent development of cysts. As in the case of the thyroids, the struggle to compensate for a deficiency ultimately ends in structural disaster unless relief is found in dietary or other changes.

6. Higgins, C. M., and Sheard, Charles: The Effects of Selective Solar Irradiation on the Parathyroid Glands of Chicks, Am. J. Physiol. 85: 299 (June) 1928.

Current Comment

CARRION'S DISEASE

Now that the chains of evidence associating verruga peruana with the acute, febrile disease commonly referred to as oroya fever and demonstrating the insect vector have been forged,[1] it seems worth while to consider the merits of some of those scientists who have contributed to the desired end. Yellow fever, bubonic plague, malta fever, typhoid, African relapsing fever and typhus fever are dreaded maladies that have claimed human toll from among those who have devoted themselves to the unraveling of the disease mysteries. Medical history will never fail to record the real martyrdom of such men as Lazear, Yersin, Müller, Carbone, Macfadyen, Dutton, Ricketts, McClintic, Bacot and Noguchi, all of whom lost their lives in the investigation of diseases with which their names have been associated.[2] The name of the Peruvian physician Barton, who discovered in the red blood corpuscles of patients with oroya fever certain rod-shaped bodies resembling bacilli which Noguchi subsequently succeeded in cultivating as the bacterial incitant of the disease, has been immortalized in the designation *Bartonella bacilliformis*. The American entomologist Charles H. T. Townsend, who definitely associated the transmission of the microbiotic offender by blood-sucking gnats of the class *Phlebotomus*, will be recalled in the designation of *Phlebotomus verrucarum* Townsend; while the new species *Phlebotomus noguchii*, whose females also carry *Bartonella bacilliformis*, recalls in its name one of the final contributions that lent distinction to Hideyo Noguchi in a career recently brought to an untimely close. Let us not forget, however, the sacrificing spirit of the medical student Daniel A. Carrion,[3] who attempted in 1885 to establish the identity of so-called oroya fever and verruga. Carrion inoculated himself on both arms with tissue

1. Noguchi, Hideyo; Shannon, R. C.; Tilden, Evelyn B., and Tyler, J. R.: Phlebotomus and Oroya Fever, Science **68**: 493 (Nov. 23) 1928.
2. References to some of these may be found in Garrison, F. H.: An Introduction to the History of Medicine, Philadelphia, W. B. Saunders Company.
3. The name is quoted from Garrison's History of Medicine. In a recent issue of Science (footnote 1) it is given as David Carrion.

juice taken from "Peruvian warts" or verrugas, developed the fever, and died. The self-sacrificing experiment settled the controverted point. The malady at issue has sometimes been referred to as Carrion's disease, obviously a more fitting designation than that which associates it with a limited region in South America where cases chanced to be common. The tribute that Smith[4] has paid to another martyr to science is worthy of repetition in connection with Carrion's heroic venture:

> Above one of the portals of Memorial Hall at Yale is the inscription, "We who must live salute you who have found strength to die." This sentiment is dedicated to those students who gave their lives on the battlefield for their country. No village or hamlet in this or any other country is too small to have a monument to its soldier dead. Romance, fearless heroism and tender memories crystallize out of wholesale human combat. But there have been other struggles which have claimed their share of human interest—spiritual contests, strife against fear and superstition, and struggles against disease and pestilence."

THE NATIONAL RESEARCH BUREAU QUESTIONNAIRE

Dermatologists have recently received a letter and an accompanying questionnaire from Cincinnati. The letter is signed "National Research Bureau, By M. M. Downing." It opens with the statement that the "Bureau" has been told by a "well known authority that more than 90 per cent of all people suffer from the most common forms" of skin disorders, "such as acne, blackheads, freckles, muddiness, etc.," and that only 10 per cent of all men and women have a skin that is clear and free from blemishes. In order to have further light on this abstruse question, the National Research Bureau wants the dermatologists to whom it writes to answer four questions. The questions read:

> "1. Is it true that 90 % of all people have some form of skin disorder or discoloration?
> "2. In your opinion do skin blotches affect the success of individuals?
> "3. Is there a growing tendency for people to consult a skin specialist for the correction of skin troubles?
> "4. Should people with skin trouble have it corrected immediately or let it take its course?"

Many of the physicians who have received this questionnaire have written to THE JOURNAL asking for information about the National Research Bureau. Investigation shows that the National Research Bureau is merely an imposing name used by an advertising agency, the Procter and Collier Company. M. M. Downing appears in the Cincinnati directory as a stenographer. We are justified in assuming, therefore, that the questionnaire that physicians are asked to fill out is nothing but an attempt on the part of an advertising agency to get expert opinions at the cost of a two-cent stamp, and that these opinions will be used to bolster up an advertising campaign of somebody's soap or ointment. Obviously, there is not the slightest justification, either economic or moral, for sending out a questionnaire to the medical profession on the stationery of an imposingly named organization that exists only on paper. If advertising concerns wish to get expert testimony from the medical profession, the least they can do is to make it plain to physicians that such information is desired for advertising purposes. Of course, so long as physicians continue to answer questionnaires from sources of which they know nothing, so long, doubtless, advertising concerns and others will take advantage of their easy-going tolerance. When physicians make a routine practice of consigning to the waste-basket or the ash-can every questionnaire that asks for free advice and comes from an unknown source, the questionnaire nuisance will be a thing of the past.

4. Smith, A. H.: Bacot, a Martyr to Science, Scient. Monthly **15**: 359 (Oct.) 1922.

A CENTRAL SCIENTIFIC EXHIBIT

In February, 1928, the Committee on Scientific Exhibit of the American Medical Association, as reported elsewhere in this issue,[1] recommended to the Board of Trustees the establishment in the headquarters of the Association of a permanent central scientific exhibit. The scientific exhibits at each annual session of the Association make available constantly demonstrations of progress in medical science. These exhibits act as a unique source of material not available in any other way. With the definite approval of the Board of Trustees—indeed with its hearty cooperation—the beginnings of the permanent exhibit are already installed. From the exhibit made at Minneapolis, sections devoted to tularemia, leprosy, lymphoblastoma, cutaneous granuloma and changes in the eye have been designated as suitable for the permanent exhibit; some of these are already in place on a special portion of the sixth floor of the present headquarters building of the American Medical Association. As their value from an historical point of view becomes established portions of the exhibit will be retained for permanent inclusion; each year, new material from the point of view of advancement in medical science will be added. In the final exhibit the Association will provide a handsomely housed, graphic and accurate picture of the history of medicine in America. Here is a venture that should arouse and hold the interest of every American physician, regardless of his location or of the nature of his special practice. The fundamental feature of the annual exhibits is the fact that it gives opportunity to men in all fields of medicine to bring themselves rapidly abreast of progress in other fields. The tendency to partition the human body and medical practice into air-tight compartments and the urging of practitioners to display interest only in certain special phases of medical practice is a menace to real progress and to the confidence of the public in medicine. An exhibit such as has been projected by the Committee on Central Scientific Exhibit and by the Board of Trustees is invaluable in revealing to both physician and layman the interest of modern medicine in the human being as a whole, in all the diseases and pathologic conditions that afflict him, in all the medical, surgical and biologic measures that modern medicine has to offer for his relief. In this plan every member of the American Medical Association may well display active interest and to it he should lend complete support.

1. Association News, page 1810.

Association News

MEDICAL BROADCAST FOR THE WEEK

The American Medical Association Morning Health Talks and Evening Health Hints from Hygeia

The American Medical Association broadcasts daily at 10 o'clock in the morning, central standard time, over Station WBBM (770 kilocycles, or 389.4 meters).

The program for the week of December 10 to 15 will be as follows:

December 10. "Christmas Shopping for the Child," by Dr. R. G. Leland.
December 11. "The Well Ordered Day," by Dr. James Nall.
December 12. "Is the Male Inferior?" by Dr. R. G. Leland.
December 13. "Your Opportunity for Health," by Dr. R. G. Leland.
December 14. "A Little Gland with a Big Job," by Dr. John M. Dodson.
December 15. "Medical News," by Dr. J. F. Hammond.

Evening Health Hints from Hygeia at 8 o'Clock, Central Standard Time

December 10. What to Do for Measles.
December 11. Treat Your Eyes Right!
December 12. The Belt Line is the Life Line.
December 13. A Lesson in Civics.
December 14. Preserving Your Teeth.
December 15. What Do We Talk About?

THE CENTRAL SCIENTIFIC EXHIBIT

The Scientific Exhibit at the annual sessions of the American Medical Association has developed in scope and improved in quality until it has become an outstanding feature. Contributions have come from all parts of the country and the individual exhibits have been prepared and actually demonstrated by many of the most capable men in the American profession.

The Board of Trustees, believing that many of the exhibits have real educational value and that they are entirely worthy of preservation and usable for purposes of instruction, has appointed a Committee on Central Scientific Exhibit to consider ways and means for the establishment and maintenance of an exhibit of permanent or semipermanent nature. Dr. Ludvig Hektoen is chairman, and his associates on the committee are Drs. C. R. Bardeen, W. A. O'Brien, Thomas Ordway and David Riesman. Dr. P. N. Leech, director of the Scientific Exhibit, is the secretary. The committee has been actively at work for some months and as the result of its efforts, and through the generosity of several contributors to the Scientific Exhibit at Minneapolis, the beginnings of the Central Scientific Exhibit are now in evidence on the sixth floor of the Association's building in Chicago. Space has been made available that will accommodate additions of the next three years. Beyond that, plans will have to be made in accordance with possibilities.

The following exhibits were selected, and donated, after the Minneapolis session:

1. Tularemia, by Dr. Edward Francis, U. S. Public Health Service, Washington, D. C.

2. Tularemia (Francis' Disease), by Dr. Walter M. Simpson, Dayton, Ohio.

3. Stereoscopic photographs of the living eye, showing the fundus changes in the constitutional diseases, syphilis, nephritis, diabetes, tuberculosis, and also showing some of the stationary and progressive types of cataracts, by Dr. Arthur J. Bedell, Albany, N. Y.

4. Leprosy, by Dr. O. E. Denney, U. S. Public Health Service, Carville, La. Lymphoblastoma, by Dr. Paul A. O'Leary of the Mayo Clinic and Mayo Foundation, Rochester, Minn. Cutaneous Granulomas, contributed by Drs. F. J. Eichenlaub, Clark W. Finnerud, Howard Fox, Henry H. Hazen, James Herbert Mitchell, Oliver S. Ormsby, William Allen Pusey, Jay F. Schamberg, Bedford Shelmire, as exhibitors; photographs from the collections of Drs. Louis A. Duhring and Henry W. Stelwagon; assembled by the Committee on Section Exhibit, composed of Drs. C. W. Finnerud, F. J. Eichenlaub, H. E. Michelson and F. D. Weidman. (The exhibits under 4 were those of the Section on Dermatology and Syphilology.)

All except one have been shipped, half of them have been installed, and the rest will be put in place as soon as possible. Members of the Association are cordially invited to see these exhibits at their convenience. Not all details of arrangements for demonstration have been worked out, but this will be done. In the meantime the exhibits now in place are instructive and quite worth study by any who are at all interested.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Society News.—The annual meeting of the San Francisco County Medical Society, December 11, will be addressed by John L. McNab, a well known attorney, on "Symptoms and Diagnoses."——Dr. Arthur E. Guedel, Beverly Hills, formerly professor of anesthesia at the University of Indiana School of Medicine, Indianapolis, gave a public lecture, December 6, at the University of California Medical School, San Francisco, on "Influence of Anesthetics on the Postoperative Condition of the Patient."

County Societies See "Canti Cancer Film."—The motion picture kown as the "Canti Cancer Film" was exhibited before a public meeting of the Fresno County Medical Society, Fresno, December 4, and before the Stanislaus County Medical Society at Modesto in November. The film, prepared in London, arrived in California in August and is being exhibited under the management of the lecture department of the University of California. It depicts in three reels the growth and division of cells in tissue culture and the effect of radium on normal and malignant cells. Requests for the picture have been received from medical and dental associations in other communities.

State Medical Library Proposed.—*California and Western Medicine* proposes the establishment of a state medical library, pointing out its benefit to the health and prosperity of the state. While such a medical library would be worthy of state support, the editors call attention to an existing fund that has been created by the medical profession. It is said that the state board of medical examiners of California had on September 30 a reserve fund of about $199,000, which has been accumulating for years from fees for licenses and reciprocity. The board of examiners works under a budget recommended by the state board of control and its expenses are paid from this fund. The board has received practically no money from the general tax fund of the state. It is assumed that if this reserve fund continues to grow, it will be transferred by the state legislators to the general funds of the state. Such an effort should be opposed, and the fund or a part of it used by the profession to upbuild the practice of medicine. The state library at Sacramento was recently housed in a new extension of the Capitol, in which there is ample space for a medical library. There are now few medical books on its shelves and practically none are being bought. It is proposed by the editors that half of the foregoing fund be set aside by the next legislature as a means of bringing into existence a state medical library.

DELAWARE

Survey of Shellfish Waters.—Members of the U. S. Public Health Service and the state board of health surveyed again this year Delaware's oyster-growing areas including Delaware Bay, St. Jones Creek, Murderkill River, Mispillion River, Broadkill Creek and Lewes Canal. Oysters were collected by the board, October 1-3, from the oyster beds and from eight shucking houses. The tests indicated that the four creeks are polluted and unfit for growing oysters for immediate delivery. These tests, the board says, confirm the tests of last year and warrant the closing of the four creek areas. The board advises that in case oysters are transplanted from the creeks into the bay at a distance remote from the outlets of the creek, the board should be notified of such transplanting and of the area chosen.

Immunizing Preschool Children.—The state board of health is assisting in the immunization of preschool children against diphtheria. Toxin-antitoxin clinics are being conducted in towns in each of the three counties of the state where these children may be immunized. It is pointed out that the younger

the child, the greater the need for immunization and the less the reaction. The campaign for the eradication of diphtheria has been going on in Delaware for two years and about 30,000 children have been immunized. Deaths from diphtheria have decreased from a rate of 13 per hundred thousand of population in 1925 to 5 per hundred thousand of population in 1927. Of all deaths from this disease last year, 77 per cent were in children under 10 years of age, and of this number 60 per cent were under 5 years of age. The state board advises parents to take their babies either to the family physician for inoculations or to one of the clinics of the board being conducted throughout the counties.

FLORIDA

Personal.—Dr. William M. Bevis has resigned as Polk County health officer and Dr. Alfred T. Eide, Haines City, has been appointed to that position.——Dr. John W. Shisler has taken up the duties of director of public welfare of Miami.——Dr. Daniel C. Main has returned to Florida to practice neurology and psychiatry after several years' service at St. Elizabeth's Hospital, Washington, D. C.

Society News.—Roentgenologists of the state held an organization meeting at Tampa, October 27, and planned to meet again preceding the annual meeting of the state medical association; Dr. Lester W. Cunningham, Jacksonville, was made chairman for the coming year. Dr. Joseph B. Farrior, Tampa, addressed this meeting on "Aid of Roentgen Examination in the Diagnosis of Diseases of the Antrums."——At the annual meeting of the Central Florida Medical Society, Orlando, October 18, Dr. Gerry R. Holden, Jacksonville, gave an address on "Use of Radium in Gynecology."——Dr. Frederick J. Waas, Jacksonville, president of the Florida Medical Association, addressed the Jacksonville Kiwanis Club, October 31, on "Medical Ethics."——The Florida Midland Medical Society met at Lakeland, October 10, as the guest of the Polk County Medical Society. This organization is composed of physicians from towns of the west coast. Among others, Dr. Earle H. McRae, Tampa, discussed "Cancer in Children—Report of Cases"; Dr. Horace A. Day, Orlando, "Chronic Endocervicitis," and Dr. Jack Halton, Jacksonville, "Rectal Stricture," with report of cases.

ILLINOIS

Society News.—The fifty-fifth annual meeting of the North Central Illinois Medical Association was held at Peoria, December 4, under the presidency of Dr. William A. McNichols, Dixon. Among others, Drs. Carl E. Black, Jacksonville, presented "A Study in Cholecystography"; Francis L. Reder, St. Louis, "Remarks on Paralytic Ileus"; Arthur Sprenger, Peoria, "The Obstructive Prostate and Its Treatment," and James P. Houston, Sterling, "An Old Doctor's Reminiscences." Among the speakers from Chicago were Drs. Samuel S. Winner, Samuel J. Burrows, Clarence W. Hopkins and Roy E. Flesher.——The Illinois State Trudeau Society will meet at Champaign in conjunction with the county medical society, December 13. The speakers will be Drs. Clarence L. Wheaton, Minas Joannides, Robert S. Berghoff, Frederick Tice and Newell C. Gilbert, all of Chicago; Walter H. Watterson, Maywood; Frank Deneen, Bloomington, and William D. Chapman, Silvis.

"Milk Sick" During the Boyhood of Lincoln.—In the last few years THE JOURNAL has published original articles and news items concerning outbreaks of snakeroot poisoning in the middle west. It is interesting to note in the December *Atlantic Monthly* a reference to this disease at the time of Abraham Lincoln's boyhood. Wilma Frances Minor discusses the migration of the Lincoln family from Kentucky to Spencer County in southern Indiana. Abraham was then 7 years old. She says: "Their first shelter in Indiana was a pole shack, open on one side, in a half-acre which Thomas Lincoln cleared on Little Pigeon Creek, not far from the Ohio River. Later they moved into a more substantial cabin; but about them grew a poisonous plant variously known as snakeroot, deerwort, squaw-weed, or by other names. Cows eating it developed a strange malady which attacked also the people who drank their milk. With this mysterious disease Nancy [Abraham Lincoln's mother] became infected. Betsy and Thomas Sparrow, Nancy's aunt and uncle, who, with her cousin Dennis Hanks, had come to live with the Lincolns, had already been stricken and died. Now, in October, 1818, Nancy herself succumbed. . . . In 1830, occurred another epidemic of 'milk sick.' Mrs. Lincoln was alarmed [Abraham's father had remarried] and again the family moved, Thomas Lincoln disposing of his land to James Gentry, and journeying with his wife and Abraham 200 miles . . . to a thickly wooded spot on the bluffs of the Sangamon River about six miles west of Decatur, in Macon County, Illinois."

Chicago

Professor Maximow Dies.—As THE JOURNAL went to press, a report was received of the death, December 4, of Dr. Alexander A. Maximow, professor of anatomy at the University of Chicago. An obituary will be published in the next issue.

Dr. Frank to Lecture at Illinois.—The University of Illinois College of Medicine announces that Dr. Robert T. Frank, New York, will deliver the Charles Sumner Bacon lectures for 1928, December 12-13, in the library of the Research and Library Building, and that members of the Chicago Medical Society are invited to attend. The subjects will be (1) "Present Status of the Female Sex Hormone"; (2) "Application of the Study of the Female Sex Hormone to Clinical Medicine."

Staff of the New Coroner.—Dr. Herman N. Bundesen, who became coroner of Cook County, December 3, has announced the appointment of coroner's physicians, each of whom, he said, has been selected with the assistance of an advisory committee from the faculties of the four leading universities in Chicago. The appointments are as follows:

Dr. George J. Rukstinat, for six years assistant to Dr. LeCount, and at present instructor in pathology at the University of Chicago.

Dr. Eustace L. Benjamin, assistant resident pathologist at the county hospital.

Dr. Samuel A. Levinson, assistant professor of pathology at the University of Illinois College of Medicine, and assistant director of research at the Municipal Tuberculosis Sanatorium.

Dr. Chester C. Guy, instructor in pathology at Loyola University since 1924, and pathologist at St. Bernard's Hospital.

Dr. Francis D. Gunn, pathologist at Wesley Memorial Hospital, and associate professor of pathology at Northwestern University Medical School.

Dr. Hamilton Rodell Fishback, assistant professor of pathology at Northwestern University Medical School.

Dr. Paul G. F. Schmitt, resident pathologist for two years at the county hospital, and member of the coroner's staff since last May.

In addition Drs. E. R. LeCount, professor of pathology and chairman of the department, Rush Medical College, and Richard H. Jaffe, director of the laboratory, Cook County Hospital, and associate professor of pathology and bacteriology, University of Illinois College of Medicine, were appointed as consulting coroner's pathologists. Dr. Bundesen is said to be the first physician coroner in Cook County in sixty-five years.

Society News.—The Chicago Medical Society will hold a joint meeting with the Chicago Council of Medical Women at the Medical and Dental Arts Club, December 12. Dr. Mary E. Hanks will read a paper on "Roentgen Therapy in Fibromyomas and Other Benign Gynecologic Conditions," and Dr. Leda J. Stacy, Rochester, Minn., a paper on "Carcinoma of the Fundus Uteri."——The Chicago Surgical Society held its December meeting at the Cook County Hospital in the morning, December 7. Among others, Dr. Eugene St. Jacques, Montreal, read a paper on "Clinical Aspects of Splenomegaly," and Dr. Norman S. Shenstone, Toronto, on "Treatment of Empyema Tuberculosis."——The eye staff of Cook County Hospital held a "fundus clinic" under the auspices of the Chicago Ophthalmological Society, December 7; the society will hold a symposium on optic neuritis, December 17, at 185 North Wabash Avenue, in which the speakers will be Drs. William H. Wilder, Norval H. Pierce and Lewis J. Pollock. Dr. James E. Lebensohn will speak on "An Oculogastric Reflex Experimentally Demonstrated."——The Chicago Pathological Society will meet, December 10, at 185 North Wabash Avenue.——Dr. Dallas B. Phemister will give the fifth Louis Linn McArthur lecture of the Billings Foundation before the Institute of Medicine of Chicago at the City Club, February 22, on "Newer Knowledge of Pyogenic Infections of Bone."——The fifth Ludvig Hektoen lecture of the Billings Foundation will be delivered, March 29, at the City Club, by Dr. Homer F. Swift of the Rockefeller Institute, New York, on "Rheumatic Fever."

INDIANA

Personal.—Dr. Malachi R. Combs, Terre Haute, was guest of honor at a birthday dinner, November 2, at which he was presented with a parchment scroll signed by the 128 physicians present. The address of the evening was given by Dr. William Wayne Babcock, Philadelphia, on "Spinal Anesthesia."——The late Dr. Frank A. Morrison, Indianapolis, willed to the Indiana University School of Medicine more than 400 books, periodicals and instruments, which will form the nucleus of a special library at Indianapolis to be known as the Frank A. Morrison Ophthalmological Library. Some of the books are historic first editions.

Society News.—Dr. Louis R. Effler, Toledo, Ohio, addressed the Muncie Academy of Medicine, Muncie, November 6, on "The Press, the Public and the Physician."—— Drs. Robert M. Moore addressed the Indianapolis Medical Society, November 13, on heart failure; Walter F. Kelly, heart failure in pregnancy, and Marie B. Kast, heart failure and anesthesia. —— Dr. George R. Clayton, Monon, was elected president of the Monon railroad surgeons society at the annual meeting at French Lick; the next meeting will be in Chicago. ——Dr. Delbert O. Kearby addressed the Indianapolis Medical Society, November 27, on "Symptomatology of Acute and Chronic Maxillary Sinus Infection," and Dr. Wendell D. Little on "Treatment of Cutaneous Burns."——Dr. Joseph Colt Bloodgood, Johns Hopkins University School of Medicine, Baltimore, held a diagnostic clinic at the James Whitcomb Riley Hospital, Indianapolis, December 7, and gave a public address on "Cure and Prevention of Crippling in Children by an Early Recognition and Treatment of Bone Disease." In the evening, Dr. Bloodgood addressed a joint meeting of the Indianapolis Medical Society and the Marion County Medical Society at the Indiana University School of Medicine, on "Diagnosis of Bone Diseases in Children."

LOUISIANA

Dr. Dowling Loses in State Supreme Court. — The Supreme Court of Louisiana, November 26, upheld the validity of the state law which reorganized the state board of health and terminated the tenure of office of Dr. Oscar Dowling as state health officer after more than eighteen years' service. The New Orleans *Times-Picayune* says that Governor Long shortly after his inauguration requested Dr. Dowling to resign, and on his refusal, the legislature passed act 126 of 1928 reorganizing the department of health. The governor then appointed Dr. Joseph A. O'Hara, but Dr. Dowling refused to surrender the office. Suit was brought to oust Dr. Dowling, who contended that the new law was unconstitutional. The lower court ruled the act valid and an appeal was made to the supreme court. Dr. O'Hara is a native of New Orleans, a former coroner, and a graduate of Tulane University of Louisiana School of Medicine. He began to practice in 1901, and for years has specialized in nervous and mental diseases.

MARYLAND

Personal.—Dr. and Mrs. Joseph Colt Bloodgood, Baltimore, have fully recovered from injuries received in a recent accident in which their automobile went over an embankment. Dr. Bloodgood returned to work in his office, November 26.

Hospital News.—Johns Hopkins Hospital, Baltimore, for the first time, it is said, has sought a contract with the supervisors of Baltimore City Charities for the care of city patients, requesting $25,528 for the maintenance of forty-five free beds for the next year.

Correction—The Osler Club. — THE JOURNAL, November 17, published a society news item indicating that the Osler Historical Club had been rechristened the Book and Journal Club. Instead, the Book and Journal Club, which Dr. Osler founded, was rechristened the Osler Club. The first meeting under the new name was held November 27.

Changes in Health Officials.—Dr. Joseph P. Franklin, director, bureau of communicable diseases, Baltimore City Health Department, has resigned, effective January 1, to accept an appointment with the state health department as health officer of Allegany County, succeeding the late Dr. Champe C. McCulloch, Jr. He will be also a deputy state health officer with jurisdiction in other counties in Maryland. Dr. Lyman S. Abbott, after seven years service with the Baltimore City Health Department, has resigned to accept a position in St. Louis, and will leave December 29.

MICHIGAN

Society News.—Wayne County Medical Society conducted a symposium on rabies, December 1, the speakers being Drs. William M. Donald and Arthur L. Amolsch, Detroit, and Dr. Herbert W. Emerson, director, Pasteur Institute, University of Michigan.——Dr. Hugh Cabot, dean, University of Michigan Medical School, Ann Arbor, addressed a dinner meeting of the Exchange Club and members of the Oakland County medical and dental societies, Pontiac, November 23, on "The Physician and His Relation to the Community."——The Highland Park Physicians Club was addressed, December 6, by Dr. William H. Marshall, Flint, on "Some Problems of the Obscure Fevers."

Diphtheria Prevention Campaign—No Clinics. — The department of health reports that 1,485 cases of diphtheria occurred in Detroit this year up to November 17, with 179 deaths; 90 per cent of the deaths occurred in children under 10 years of age. The number of cases is not unusual, but the deaths are high and diphtheria is on the increase. In October, in one school, there were eight cases with three deaths; more recently there were three cases in the first grade, and these three children died. The health department urges parents to protect their children between 6 months and 10 years of age against diphtheria by means of toxin-antitoxin, and advises that they be taken to their physicians at once, if they have not already been inoculated. There will be no clinics this year. Toxin-antitoxin will not be given in the schools, but during the next three months there will be an intensive prevention campaign carried on by the physicians of the city. The department adds that material for performing the Schick test and the giving of toxin-antitoxin has been made readily available to all physicians. The Wayne County Medical Society emphasizes the importance of this campaign in its bulletin, December 4, stating that if the campaign fails the entire program outlined by the society "will be doomed; the free clinic will have a new lease of life and its sponsors will have the figures to justify their existence. Do your share to make this experiment a success."

MISSISSIPPI

Society News.—At the December 13 meeting of the South Mississippi Medical Society, Laurel, among others, Drs. Joseph S. Gatlin, Laurel, will speak on "Pellagra"; Charles G. Wright, Hattiesburg, "Artificial Feeding of Babies"; Rowland W. Hall, Jackson, "Eczema," and William A. Dearman, Gulfport, "Tumor of the Brain."——Dr. C. J. Lewis has resigned as assistant superintendent of the South Mississippi Charity Hospital, Laurel, to engage in practice in Meridian, and Dr. Thomas R. Beech, Ellisville, has been appointed his successor. Among others, Dr. Winston G. Pool, Cary, addressed the Issaquena-Sharkey-Warren Counties Medical Society, November 13, on "Bismuth Salts in the Treatment of Syphilis." At the annual meeting of this society, December 11, Drs. John H. Musser, New Orleans, and Guy Caldwell, Shreveport, will be the speakers; officers of the Mississippi and Louisiana state societies and others have been invited to attend.——Dr. Henry C. Ricks assumed the duties of director of the bureau of communicable diseases of the state board of health, October 1. Dr. Ricks recently was director of laboratories of the Oklahoma State Department of Health.——Dr. Felix J. Underwood, Jackson, state health officer, has been chosen president of the medical alumni of the University of Tennessee.

NEW YORK

Health at Utica.—Telegraphic reports to the U. S. Department of Commerce from sixty-eight cities with a total population of about 30 million, for the week ending November 24, indicate that the highest mortality rate (20.1) was for Utica and for the group of cities as a whole, 12.7. The mortality rate for Utica last year was 14.6 and for the group of cities, 11.6. The annual rate for sixty-seven cities for the forty-seven weeks of 1928 is 12.8, as against a rate of 12.2 for the corresponding weeks of 1927.

"Tooter" Arrested in Buffalo.—A man has been arrested in Buffalo for tooting his automobile horn on a thoroughfare while waiting for the signal lights to change. The judge not only fined and severely reprimanded the noise maker but commended the policeman for making the arrest. The Buffalo Department of Health is of the opinion that such noises not only affect "the disposition and nerves of our citizens but they may even be instruments of death. Oftentimes sleep may be the only hope for someone fighting a battle against death and this has finally been snatched away by some unthinking person. The sick infant who has finally been put to sleep by weary parents is unable to ignore these blasts. The tired workman and the nervous business man, alike, are bound to spend an interrupted night when these pests pass through the neighborhood. Unnecessary noise has no place within our city and should be stopped. People who commit such acts deserve not only the scorn of their neighbors but should feel the grip of the law."

Report of Investigation of Olean Epidemic.—At a public meeting, November 9, of the council of Olean in Cattaraugus County (the council chamber was reported to have been "jammed to overflowing"), Dr. Matthias Nicoll, Jr., state health commissioner, who had been requested by the council to investigate the typhoid epidemic, made a report. The epidemic, which resulted in a total of 212 cases and at least

eighteen deaths, was said to be due to a break in a submerged suction pipe connecting the wells on one side of the Allegheny River with the pumping station on the other. The city discharged untreated sewage into the river above the South Olean pumping station and the broken pipe therefore permitted gross pollution to be pumped into the city's water mains and reservoirs. The quantity of chlorine added automatically to the water was insufficient to take care of this amount of contamination. *Health News*, published by the state department of health, indicates that had daily tests for excess chlorine been made as recommended by the state department, the increased amount of chlorine required to produce an excess would have been noticed immediately. Fluctuations in the pumpage during the summer and the finding of *B. coli* in nine out of sixteen samples of water should have caused an investigation to be made for a leak in the submerged pipe. Thousands of cases of diarrhea occurred after the middle of August, but were not reported by the health officer to the state department. The report not only shows the conditions that caused the epidemic, but places the responsibility. According to the *Jamestown Post*, it rests on the shoulders of the three water commissioners, the city health officer and his acting deputy. The resignations of the superintendent of the North Olean filtration plant and the superintendent of the water department were requested. Dr. Nicoll recommended that the South Olean pumping station be abandoned; that the North Olean filtration plant be enlarged to insure the delivery of water adequate in quantity and of a safe sanitary quality, and that two chlorinators of greater capacity be installed; that reports of unusual prevalence of enteric disease be made immediately by the county or local health officer to the state department of health and to the local water officials; that bacteriologic examinations of the water for typhoid be made and tests for excess chlorine carried out at least twice daily, and that reports of these examinations be forwarded daily to the county and city health officers as well as any observations indicating contamination of the water supply.

New York City

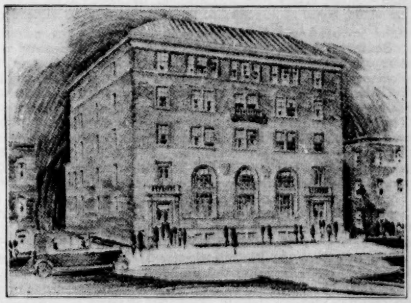
Dr. Bristol Resigns.—Dr. Leverett D. Bristol, who has served the Milbank Memorial Fund health demonstrations in New York as executive officer for six years, has resigned to accept an appointment in industrial health work.

Professor Levaditi to Give Harvey Lecture.—Dr. C. Levaditi, professor of microbiology, Institut Pasteur, Paris, France, will give the third Harvey Society Lecture at the New York Academy of Medicine, Thursday evening, December 13, on "Metallotherapy of the Spirochetoses."

Examination of School Children.—The sanitary code of New York requires a medical examination of each school child on his entering school. The health department therefore gives each child a form card on admission and a letter explaining to his parents the requirement and urging them to have the examination made promptly by their family physician. If no report is received from the parents in a reasonable time, the health department takes steps to have the child examined by the school physician. The health commissioner requests physicians to assist his department in this work by returning reports of their examinations promptly and by urging parents to have the necessary corrective work done before the child gets in the upper grades. It is the constant aim of the department of health not to undertake any medical work that can and will be done satisfactorily by the family physician. Section 200 of the sanitary code states that a health certificate prepared in accordance with the regulations of the department of health and signed by a physician licensed to practice in New York shall be furnished by each pupil at the time of his admission to public school or other free school supported in whole or in part by direct taxation.

Society News.—Physicians and dentists are invited to the December 10 meeting of the American Stomatological Association at the Columbia University Club for a symposium on focal infection. The speakers will be Dr. George H. Bell, Dr. Arthur Nilsen, Harold J. Leonard, D.D.S., Dr. Redford K. Johnson, Dr. William R. Delzell and Dr. Russell W. Morse.——The Medical Society of the County of Queens was addressed, November 23, by Dr. Jesse G. M. Bullowa on "Serum Treatment and Its Evaluation in Lobar Pneumonia," and November 27, by Dr. William W. Herrick on "Medical Complications of Pregnancy."——The annual Biggs Memorial lecture was given, November 22, at the New York Academy of Medicine, under the auspices of the New York County Medical Society and the New York Tuberculosis and Health Association, by Prof. Charles Edward A. Winslow of Yale University School of Medicine, New Haven, Conn., on "Contributions of Hermann M. Biggs to the Public Health Campaign."——Dr. Margaret E. Fries addressed the New York Electrotherapeutic Society, December 5, on some aspects of the international light conference at Lausanne, and Dr. Richard Kovacs on recent impressions of physical therapy in central Europe; Dr. Norman E. Titus gave a report of physical therapy at the international congress at Stockholm.——Dr. DeWitt Stetten has been elected president of the Medical Society of the County of New York for the ensuing year.——The afternoon lecture at the New York Academy of Medicine, December 7, the fifth in the series, was given by Dr. William W. Herrick on "Certain Medical Complications of Pregnancy and Their Treatment." At the stated meeting of the academy, December 6, Dr. Arthur F. Coca presented a paper on "The Skin as a Shock Tissue," and Dr. Sigmund Pollitzer, "Clinical Aspects of Allergy in Skin Diseases."

Queens County New Home.—The campaign to raise $250,000 by December 1 for the new building of the Medical Society of the County of Queens had reached the $225,000 mark in November. Practically every physician in Queens has been interviewed, and the fact that nonmembers have responded has pleased the trustees. It appears from letters and subscriptions that one benefit of the new society home would be closer cooperation and acquaintance among all the physicians of the



borough. The fact that nonmember physicians in the community will be permitted to use the facilities of the building struck a responsive chord. The building is to be erected on Queens Boulevard near Seminole Avenue, Forest Hills, on one half of the property owned by the society. The other half of the land will be sold after the completion of the subway and ultimate development of this section.

OHIO

Physicians Entertain Lawyers.—Members of the Lima and Allen County Academy of Medicine entertained members of the Allen County Bar Association at Lima, November 23, at a dinner at the Bar Hotel which was attended by about 105 persons. Among the speakers were Dr. Harry S. Noble, St. Marys, and his subject "Our Professions"; Drs. Jonathan B. Vail and Wesley L. Neville, Lima, and Judges Crow, Justice, Becker, Hamilton and Copeland. The toastmaster was Dr. James R. Tillotson.

Diphtheria Immunization Campaign.—The municipal health department and the board of education of Cincinnati are cooperating in a campaign against diphtheria in children less than 10 years old, which will continue from December 3 to January 26. Toxin-antitoxin may be administered by family physicians or parents may bring their children to the schools which the board of education has agreed to the use of for that purpose during the holidays. The district school physicians will administer the inoculations at the schools.

New Hospital for Feebleminded.—In 1925 the general assembly appropriated funds to secure a site for a new state hospital for the feebleminded in northern Ohio, and after many delays 1,500 acres of land was finally acquired at Apple Creek. At its meeting in October the state board of control released additional funds for buildings for the new hospital which had already been appropriated by the legislature so that at the present time there are $460,000 available for buildings. The board of control refused, however, according to the *Ohio State Medical Journal*, to transfer about $119,000 from the hospital's general fund to the building for the reason, it is said that the legislature fixed the maximum which could be expended in the

erection of buildings. The board held that the architect must revise his plans in order to bring the building cost within the legislature's allowance, which is somewhat larger than the foregoing amount, as the board had previously released funds for building purposes.

Personal.—Fred Berry, chief of laboratories of the state department of health for nine years and on the staff of the laboratories for nearly twenty-two years died, October 20, of nephritis.——Dr. Chalmers C. McLaughlin, Dunkirk, has been reelected for the fourth time health commissioner of Hardin County.——Dr. Oscar E. Townsend has been appointed director of a public school medical clinic established in Elyria.——It is reported that Dr. Herbert O. Black has been named medical superintendent of the new $800,000 Stark County Tuberculosis Sanatorium at Alliance, he having received the highest grade in the civil service examination. Dr. Black has been medical examiner at the U. S. Veterans' Bureau Hospital at Cleveland. The new hospital near Alliance will not be ready for occupancy until after the first of the year.——Dr. Cassius M. Shepard, Columbus, has been appointed to the consulting staff of the Ohio Soldier's and Sailors' Orphans' Home, Xenia, to succeed John E. Greiwe, Cincinnati; Drs. Arthur C. Bachmeyer and Albert Graeme Mitchell of Cincinnati were also elected to the staff.——Dr. Harry Streett, Litchfield, has been elected a member of the board of directors of the Lodi Hospital to succeed the late Dr. James E. Waite.

Society News.—The Meigs County Medical Society was host to the Ninth Councilor District Medical Society at Pomeroy, October 11; Dr. Joseph A. Guthrie, Huntington, W. Va., discussed spinal anesthesia; Dr. Jonathan Forman, Columbus, "Renal Factor in Gastro-Intestinal Diseases." The next annual meeting will be at Portsmouth.—— The second annual Ohio Safety Congress was held at Columbus, November 13-15.—— Dr. Horace R. Allen, Indianapolis, addressed the Darke County Medical Society, Greenville, recently on "debunking" orthopedic and plastic surgery.—— The Mahoning County Medical Society was addressed in September at Youngstown by Dr. Charles C. Wolferth, Philadelphia, on "Heart Disease with Special Reference to the New Forms of Treatment."——Dr. Quitman U. Newell, St. Louis, addressed the Summit County Medical Society, Akron, October 2, on "Diagnostic Value of Iodized Oil in Gynecologic Conditions." —— The Columbus Academy of Medicine was addressed, October 8, by Dr. James H. Warren on "Diagnosis and Treatment of Pernicious Anemia."——The Cleveland Academy of Medicine devoted its November meeting to a review of the progress of medicine during the year. The papers were by Drs. Chester D. Christie on "Value of Insulin Substitutes"; Richard Dexter, "Status of Liver Extract"; Howard T. Karsner, "Abortus Infections and Clinical Medicine," and George W. Crile, "Surgical Progress in 1928."——The Cleveland Medical Library Association was addressed, November 7, by Lieut. Col. Fielding H. Garrison, Medical Corps, U. S. Army, on "The Problem of the American Medical Library."——At a meeting in Hygeia Hall at the College of Wooster, November 13, the Wayne County Medical Society was addressed by Drs. Fred G. King and George F. Zinninger, both of Canton, on practical phases of infant feeding and clinical problems in diseases of the heart, respectively.——Dr. Walter G. Stern, Cleveland, was elected president of the Central States Clinical Orthopedic Society at the recent Chicago meeting.

UTAH

Society News.—Dr. Daniel W. Sooy, San Francisco, addressed the Salt Lake County Medical Society, Salt Lake City, October 8, on "Clinical Considerations of Goiter," and Dr. James A. Guilfoil, San Francisco, on "Peptic Ulcer."—— Dr. Edward L. Rich, Ogden, addressed the Weber County Medical Society, recently, on obstetric practice in Utah.

VIRGINIA

Homicides Increase.—The registrar of vital statistics of Virginia reports that during 1927 there were 270 homicides in the state, an increase of fifty-one over the previous year. The white homicides, he says, in 1927 numbering 132, have been exceeded only once in the last fifteen years and that was in 1921, when they were 148.

Hospital News.—The state board of health is establishing a branch laboratory in connection with the new Northampton Accomac Memorial Hospital, Nassawadox, which hospital is maintained by citizens of the two counties on the eastern shore of Virginia, and the staff of which is furnished by the Johnston-Willis Hospital, Richmond.

Prizes for "Sanitated" Homes.—The state department of health of Virginia offers a prize of $500 to the county that shows the highest percentage of homes "sanitated" between June, 1928, and June, 1931, a prize of $300 to the next highest and of $200 to the next. The awards will be made to the organization in each of the three counties which is most instrumental in securing the prize. The department of health has adopted the slogan "Virginia—The First State to Be Sanitated."

WISCONSIN

Society News.—Marquette University School of Medicine alumni conducted their fourth annual clinic, November 9, during the university homecoming. Dr. Louis F. Jermain, director of the department and chemical professor of internal medicine, conducted a clinic at the Milwaukee County Hospital, on diagnosis of abdominal conditions; in the afternoon at the university, Drs. Paul B. Magnuson, Chicago, discussed "Diagnosis and Treatment of Various Kinds of Backache and Back Injuries"; Daniel M. Eisendrath, Chicago, "Relation of Urology to Abdominal Diagnosis," and George B. Eusterman, Rochester, Minn., "The Ulcer Problem—Some Practical Reflections."——A clinic on encephalitis was conducted before the Columbia County Medical Society at the County Hospital, Wyocena, recently, by Dr. Hans F. H. Reese, Madison; the councilor of the district, Dr. Cornelius A. Harper, Madison, who is also state health officer, addressed the society on "Public Health."——Dr. Milo M. Scheid, Rosendale, discussed the differentiation between mushrooms and toadstools at the October 10 meeting of the Fond du Lac County Medical Society. The other speaker was Dr. John W. Harris, Madison, professor of obstetrics and gynecology, University of Wisconsin Medical School.——A motion picture demonstration of the sequelae of encephalitis was presented to the Marathon County Medical Society at the county hospital, recently; Dr. William F. Lorenz, Madison, spoke on "Acute Encephalitis," and Dr. William J. Bleckwenn, "Chronic Encephalitis and Sequela." The society celebrated its twenty-fifth anniversary, October 8, at a dinner following which Dr. Arthur A. Pleyte, Milwaukee, read a paper on "Pulmonary Infections," and Dr. Evan M. Macaulay, Wausau, demonstrated cases illustrating unusual types of pulmonary disease.——Dr. Lewis J. Pollock, Chicago, addressed the Milwaukee County Medical Society, October 12, on "Traumatic Neurosis."——The Rock County Medical Society was addressed, recently, by Dr. Hugh T. Jones, Rochester, Minn., on "Treatment of Burn Contractures," and by Dr. Philip Lewin, Chicago, on "Orthopedics for the General Practitioner."——The Washington-Ozaukee County Medical Society, West Bend, was addressed, October 4, by Dr. Willibald J. Wehle on "Tularemia," with presentation of a case, and by Dr. Ira R. Sisk, Madison, on "Common Diseases of the Genito-Urinary Tract."——The First and Third Councilor District Medical Societies held a joint meeting at Madison, October 12; Dr. Carl H. Davis, Milwaukee, gave an illustrated lecture on the progress of obstetrics in Europe and America; Dr. Clifford G. Grulee, Chicago, discussed "Differentiation and Treatment of Anemia in Infants and Children"; Dr. Charles A. Elliott, Chicago, "Diagnosis of Pernicious Anemia," and Dr. Charles H. Mayo, Rochester, Minn., "Influence of the Sympathetic and Parasympathetic Nerves in Upper Abdominal Diseases."——The Milwaukee Academy of Medicine was addressed, October 9, by Dr. Andrew C. Ivy, professor of physiology and pharmacology, Northwestern University Medical School, Chicago, on newer physiology of the gallbladder, and Dr. John L. Yates, Milwaukee, on its application to clinical medicine.——The Tenth Councilor District Medical Society held a meeting, October 4, at Eau Claire, which was attended by about 100 physicians; clinics were conducted at the Luther Hospital in the morning and a scientific program was held at the Elks Club in the afternoon.——The Green Bay Academy of Medicine, Green Bay, was addressed, November 14, by Dr. Wenzel Wochos, Kewaunee, on "Abnormal Obstetrics."

GENERAL

The Colored Slip.—In next week's issue of THE JOURNAL will be inserted a colored slip—in effect a statement of 1929 dues for Fellowship and JOURNAL subscription. All dues are payable in advance, and it is urged that every subscriber and Fellow of the Association take prompt action on the colored slip next week, provided payment for 1929 has not already been made.

Society News.—The American Association for the Study of Goiter will hold its next meeting at Dayton, Ohio, March 25-27, 1929. Reservations may be made through the chairman of the hotel committee, Dr. Herbert C. Haning. The first

day will be devoted to dry clinics and scientific papers; the second to operative clinics and papers, and the third entirely to scientific papers.

Phi Beta Phi Convention.—The biennial convention of Phi Beta Phi will be held at St. Louis, December 27-29, with headquarters at the Statler Hotel, and with the local chapters at Washington University School of Medicine and St. Louis University School of Medicine acting as host. Opportunities for visits to these schools will be afforded and papers by members of the staffs will be presented Friday morning. The Thursday session will be devoted to business.

Schools for the Blind.—A report, prepared by the U. S. Department of the Interior, covering eighty schools and institutions for the blind for the year 1926-1927, has been received. Of the eighty institutions in the report, forty-seven are state institutions, twenty-one are schools or classes in city school systems, five are private institutions, five are private institutions supported partly by state funds and one is a school in the Philippine Islands and one a school in Porto Rico. The total enrolment in these schools for 1927 was 6,084; 2,729 were girls. The total enrolment is an increase of 22 per cent over the enrolment of the year 1918. These schools had a total of 863 instructors, of whom 643 were women. This is an increase of 122 female instructors over the year 1918. Of the total number of pupils, 3,499 were enrolled in industrial courses, 2,729 were given vocal culture, and 2,688 pupils were enrolled in instrumental music classes. The graduates from the high school departments numbered 177. There were 336 pupils in the kindergarten departments of these schools for the blind. The total expenditure in the sixty-seven institutions for the year was $3,993,404. Schools which offer courses for teachers of blind children are Perkins Institute, Watertown, Mass.; Pennsylvania Institute for the Instruction of the Blind, Overbrook, Pa. (course for prospective home teachers of the blind), and George Peabody College for Teachers, Nashville, Tenn., which give special courses during the summer for teachers of the blind and semisighted.

Pan-Pacific Surgical Conference in Honolulu.—The entire November issue of the *Bulletin* of the Pan-Pacific Union is devoted to the arrangements for the Pan-Pacific Surgical Conference to be held in Honolulu, Aug. 14-24, 1929, under the auspices of the union and at the request of the Pacific Coast surgical, roentgenologic, oto-ophthalmologic, orthopedic, gynecologic and Hawaiian Territorial medical societies. The committees have been appointed, the general chairman for Hawaii being Dr. Nils P. Larsen, Honolulu, and for the Pacific Coast states and British Columbia, Dr. George W. Swift, Seattle. The object of the Pan-Pacific Surgical Conference is to bring together surgeons from countries bordering on the Pacific to permit the exchange of ideas and the development of an acquaintanceship. Each country will select its subjects for presentation. There will not be any routine clinics. New technic will be presented in person, but "ordinary technic" is to be presented by moving picture. There are twelve general and special hospitals in Honolulu, and general and plantation hospitals in other places. On the tentative program are symposiums on surgery of the thorax, craniocerebral injuries, anesthesia, rectal surgery, and subjects pertaining to the specialties. The *Bulletin* presents the schedule of steamers sailing for the convention next August, and information concerning trips to other places. The round trip from San Francisco to Hawaii can be taken at a minimum of $250 on the *Malolo*, the fastest boat in this service. A registration fee of $10 is required for all persons in attendance. Invitations have been extended to about twenty-nine countries.

Night Work and Women's Health.—"Employment of Women at Night," a bulletin issued by the U. S. Department of Labor, gives a history of the long effort to have the system discontinued and of its abolition or regulation in thirty-six other countries under an international agreement. The United States appears to be almost alone among civilized nations in its lack of restraining laws in two thirds of the states, although at the end of 1927 in sixteen states there was some attempt at regulation. There is a need for a nation-wide survey on night work. Sufficient evidence is now available in the state surveys that have been made by the women's bureau of the department of labor to make it a matter of serious thought. Some things that argue against night work for women are the impossibility for real rest during the day, especially for those who have household duties; also, the accumulation of fatigue due to pyramided loss of normal sleep, the lack of exposure to sunlight and the presence of eye strain. A survey made about ten years ago in the Chicago stockyards showed that nearly one third of these women worked eleven hours or more, and that 3,260 women reported working ten hours or more at night. Even in periods of industrial depression the night shifts were kept on, largely on the theory that it reduced overhead expense. Expert industrial engineers are said to have testified that night work does not affect the reduction of overhead to any noticeable degree. In view of this fact and the opposition to night work by advanced employers as a cause of overproduction and of poor grade products, night work, the report says, will ultimately be eliminated in the United States.

CANADA

Personal.—Dr. Wallace N. Rehfuss has resigned from the Provincial Medical Board, Nova Scotia.——A complimentary dinner was recently tendered to Drs. Evan Kennedy and John W. McKay, New Glasgow, by members of the Pictou County Medical Society. Both guests of honor have served long in the ranks of the profession and have enjoyed "well merited esteem and confidence among all classes of the community."——Dr. Frederick G. Banting, Toronto, delivered the Cameron lecture, October 30, at the University of Edinburgh, giving an historical account of the researches that led to the discovery of insulin.

Chorea in Six Generations.—A news item in the *Canadian Medical Association Journal* states that a number of cases of Huntington's chorea have occurred in Colchester County, Nova Scotia, and that all of the patients have been descendants of a brother and sister who came to Nova Scotia from the border of France and Switzerland. There have been cases of chorea in the six generations of descendants of this brother and sister. The disease has been transmitted only by those members of the family who actually had it. Those in each generation who have escaped the disease have not passed it on to their progeny. This item appeared in connection with a case which came before a court at Truro. Action was brought to appoint a guardian for a man who had chorea. The physicians on both sides of the case agreed that the patient was competent to handle his own affairs.

FOREIGN

Noise and Public Health.—The British Medical Association has presented to the minister of health evidence of a relation of noise to the public health, and the editor of the association's journal published an editorial, November 10, on "The Age of Noise." He says: "Unless something is done quickly to check the greater volume of sound that assaults our ears, we may find ourselves deprived more and more of that capacity for sustained work, for clear thinking, and energetic action which is the mainstay of civilized life." There are suggestions on how to reduce the amount of noise. The November *Canadian Medical Association Journal* also has an editorial on the subject of noise.

Annals of Research Laboratory.—The *Annals* of the Pickett-Thomson Research Laboratory, volume IV, part I, reviews the pathologic streptococci. The volume opens with a thirty-five page historical survey of researches on the rôle of the streptococci in acute articular rheumatism. Section B takes up briefly the question, Is There a Filtrable Virus in Rheumatic Fever? section C takes up Blood Changes in Rheumatic Fever; section D, Vaccine Treatment of Acute Rheumatism and Chorea; section E, Serum Treatment of Acute Rheumatism; section F, Histology of Human and Experimental Rheumatism; section G, Association of Tonsillitis with Rheumatic Fever and Its Manifestations; section H, Prevalence and Dangers of Rheumatic Fever; section I, Age and Incidence of Rheumatic Fever; section J, Epidemiology, Infectivity and Predisposing Causes of Rheumatic Fever; section K, Miscellaneous Information, and section L, Conclusions. Sir Walter Kinnear of the ministry of health put the disbursements under the national health insurance scheme of Great Britain during 1927, on account of rheumatism, at £5,000,000. He said that if to that sum is added the amount of wages lost to the insured persons the total would reach £17,000,000. This, however, includes the cost arising from chronic arthritis as well as rheumatic fever. The second monograph in this volume takes up the rôle of the streptococci in chorea; the third monograph, the rôle of streptococci in erythema nodosum. It is said that the chief fault of the voluminous work done is that the identification of the various streptococci found was insufficient, resulting in great confusion. The president of the Pickett-Thomson Research Laboratory is Sir Ronald Ross; the director and editor is David Thomson. The *Annals* are published regularly, each volume containing about 300 pages in addition to about fifty plates, comprising several hundred photomicrographs of bacteria. The address of the editor is Pickett-Thomson Research Laboratory, St. Paul's Hospital, Endell Street, London, W. C. 2.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 10, 1928.

The Health of the Physician

In an inaugural address to a course of "Industrial Diseases" Dr. E. Graham Little, dermatologist and member of parliament for London University, spoke on "The Health of the Medical Practitioner." He said that the "decennial supplement to the registrar-general's report for England and Wales for 1921 furnished, perhaps for the first time, some reliable figures for occupational mortality. As compared with lawyers and with clergymen, the medical group has a much higher mortality. Two causes of death, which are unhappily notably frequent in physicians as compared with other groups, were alcoholism and suicide. The physician, especially the physician practicing in crowded industrial areas, is a much overworked man. He is often obliged to force himself to the utmost to get the last ounce of his strength brought into action in an emergency, and the peg of whisky is the quickest and most effective means of getting that last ounce of energy out of himself. In slum districts the physician ic usually an isolated, lonely and tired man. He is largely cut off from fellowship with his equals. The drabness of life is a factor in producing alcoholic habits.

The prevalence of suicide may perhaps be explained by a number of considerations. The physician who thinks he is attacked by a fatal disease may yield to a temptation to end his troubles which is not present to other persons similarly affected, and the transitory or even momentary depression may thus precipitate a fatal issue. The means of terminating his existence are always at his hand in the drugs which he handles. Also the medical calling seems never so anxious a one as it is today. The profession is greatly overcrowded. "Far from being the gold mine which popular imagination so fantastically imagines it to be, the consulting room of a physician is much more often the shortest route to the cemetery."

Dealing with other causes of death, Dr. Little said that the mortality figure for tuberculosis in the medical group is lower than the class figure would indicate, which is probably due to the open air life which the average physician leads, and perhaps also to his greater respect for the rules of hygiene. On the other hand the mortality figure for pneumonia, for influenza, and for respiratory diseases (excluding bronchitis and tuberculosis) is exceptionally high. Pneumonia is one of the chief killing diseases for the physician, ranking third in the list. This may be explained by diminished resistance, fatigue and exposure, and, perhaps, alcoholism. Again, physicians are much more subject to accidents, of which motor-car accidents form the largest proportion. High ratios are also recorded for physicians in diabetes, digestive diseases and appendicitis, an incidence which may perhaps be explained by irregular habits in taking meals, and overeating after prolonged fast.

A counterblast to this depressing picture has been made in a press interview by Dr. Alfred Cox, medical secretary to the British Medical Association. He said: "I should not call it a drab life; I should call it the most interesting life there is. There is no drabness about it except to a man who finds himself in the wrong profession. It is an exaggeration to speak of the physician's consulting room being the shortest route to the cemetery. The strain on a physician in an active practice is very great, both mentally and physically, but it must be remembered that a man cannot pursue a medical career unless he had good health to begin with. It is true that the temptation to alcohol is great in the case of the physician on account of missed meals, irregular working hours, and so forth. My own view is that, physically, physicians are as good as any other class. The life is a trying one, but I should not say that it is an especially easy road to the grave." To this Dr. Graham Little replies that his views are based on official statistics which show that, taking 1,000 as the rate for all civilian occupied and retired males, the comparative mortality rate (1,021) of physicians as a group approaches the rate (1,258) of the lowest social class in our community—which includes unskilled and casual workers—and is actually higher than the figures for the four classes above that last aggregation of the most miserable of our people. The following is the official table:

Class, Etc.	Comparative Mortality	Suicide	Cirrhosis of the Liver
All occupied and retired civilian males	1,000	1,000	1,000
Class I	812	1,156	1,625
Class II	942	1,276	1,865
Class III	951	905	656
Class IV	1,007	889	740
Class V	1,258	975	865
Occupational group—coal miners	1,034	856	583
Anglican clergy	561	1,008	521
Physicians	1,021	2,012	1,854

Fatal Prank with Compressed Air

An inquest was held on a boy, aged 14, who was killed in a shipyard at South Shields by a blast of compressed air entering the anus. An apprentice riveter, after unscrewing his hammer from his compressed air pipe, blew air at the deceased as a joke. Another apprentice had his arm on the boy's shoulder but could not say whether he was bending or not. The boy said "Oh" and collapsed. The air pressure in the nozzle of the pipe used was 100 pounds to the square inch. The jury found that the boy died from the effect of being inflated with air from a pipe held by the first apprentice. They were satisfied from the evidence and inspection of the boy's clothes that the pipe was held within about 6 inches of him. The coroner said that this amounted to a verdict of manslaughter and committed both apprentices for trial.

Malaria Control: The Ross Institute

The work that has been done in recent years for the prevention of malaria was described at a meeting held in connection with the Ross Institute for Tropical Diseases in the council room of the Rubber Growers' Association. Sir Malcolm Watson said that the medical profession, in a resolution passed at the congress of the Far Eastern Association of Tropical Medicine held at Calcutta in December, 1927, laid down a policy on the subject of malaria control. They considered that for towns, mines, plantations, large public works and similar aggregations of people the control of the breeding places of the malaria-carrying species of mosquitoes should be employed, whatever other antimalarial measures were put into force. Before effect could be given to this resolution, certain difficulties would have to be faced. In the first place, malaria control by means of mosquito control was not primarily a medical question at all. Physicians were trained principally in the diagnosis of disease and treatment of the sick; the prevention of malaria was more a health problem, and in the tropics health officers were the exception. The second difficulty had been that the control of mosquitoes was more than anything else an entomologic question. Some mosquitoes lived in shade and some in sunshine. The destruction of shade in certain places might introduce dangerous light-loving insects and increase existing malaria. The third difficulty was that for many forms of mosquito control a knowledge of drainage was necessary, and physicians were not trained in engineering schemes. The institute had formed an industrial advisory committee which hoped to be of assistance to tropical industry in supplying expert advice which was necessary before an employer could go ahead on a scheme with confidence that the money expended would give the desired results. The institute and hospital received sick men from the tropics, and it was open to physicians to come for advice or to work on the problems in which they were interested. There would be established a unique museum

illustrating all the habits of the mosquito, and information would be given to physicians as to how the insects could be controlled. Expeditions would be sent abroad from time to time to study problems on the spot along with local physicians, and to discuss with them what steps could be taken to control the disease. Ultimately, he hoped, there would be a staff of expert research officers and engineers.

Exploitation of Sham Fractures

A curious form of fraud, the exploitation of sham fractures, has been brought to light. A motor engineer pleaded guilty at a London court to two charges of fraud on an insurance company. He had a congenital condition of the left clavicle that enabled him to simulate a fracture and so to have made twenty accident claims since 1922, obtaining a total of $11,500 from nineteen of them. He had been living for years past on the proceeds of imaginary accidents. In the last case he was charged with having by false pretenses obtained from the Royal Insurance Company a policy of insurance against accidents, and a check for $810, with intent to defraud. In applying for the policy he made a number of false statements. He stated that he had no physical defect or infirmity; that he had good eyesight—though he had only one eye; that he had had no fractures or dislocations of bones, and had never proposed for or made a claim in respect of any accident policy before. The policy in question had been issued only a few days when he made a claim in respect of a fractured clavicle; a similar but unsuccessful fraud was simultaneously attempted on another insurance office. The defense said that the physical condition of the accused was not congenital, but was such as to render him liable to displacement of the shoulder blade and collar bone. He was sentenced to twelve months' imprisonment.

Fatal Error in Administration of Chloroform

"This is an unfortunate and dreadful accident" said the coroner at an inquest on a boy, aged 13, who died under an anesthetic at the Royal Surrey County Hospital, Guildford. A chloroform inhaler was used. The boy started to vomit chloroform, became asphyxiated and died. This was due to the tubes being connected on the wrong nozzle of the inhaler, and the effect was that liquid chloroform was injected into the stomach instead of vapor into the lungs. The anesthetist was responsible, as he did not take steps to examine the apparatus before starting the operation. He did not put the tubes on the bottle; they were attached ready for use. The surgeon who operated said that as soon as he smelled the chloroform he realized what had happened, as the same accident had occurred some time ago. He considered that the makers of the apparatus should in future see that the two tubes could not be interposed. Returning a verdict of death by misadventure, the jury exonerated the anesthetist and recommended that the inhaler should be altered on the lines suggested by the surgeon. It was stated on behalf of the hospital authorities that if the apparatus could be improved on in any way or a better apparatus could be found, they would adopt it.

Early Marriage in India a Cause of Maternal Mortality

The committee of inquiry on the age of marriage, sitting in Bombay, examined Dr. Margaret Balfour, late chief medical officer of the Women's Medical Service in India. She said that she had done thirty-eight years of medical work in India. In undertaking an inquiry into the mortality of childbirth she noted the age at which the first child was born in more than 1,100 consecutive and unselected cases in Bombay Hospital. The average age of the mothers was 20.5 years; only 12 per cent were 16 or under. The women were of all classes, including high caste Hindus. She considered that early cohabitation and early maternity were responsible for some part of the high maternal and infant mortality of India, and consequently for some part of the poor physique of the people.

PARIS

(From Our Regular Correspondent)

Oct. 10, 1928.

Health Measures in the Department of the Post, Telegraph and Telephone

M. Henry Chéron, minister of the postal department, has established a council on health and epidemiology as an aid to the ministry of post, telegraph and telephone. The object of the council will be to inquire into and to propose to the minister such measures as will safeguard the health of the personnel, and the salubrity of the offices utilized by the administration of the post, telegraph and telephone; to organize the campaign against tuberculosis and against infectious diseases; to aid the personnel in securing the benefits of the laws pertaining to the acquisition of small garden homes, and to assure the protection of large families. The personnel of the officials, employees and workmen will be represented on this council.

The Report of Dr. Pettit on Yellow Fever in Africa

Dr. Auguste Pettit, professor at the Institut Pasteur de Paris, who with Dr. Stephanopoulos was sent to Senegal, French West Africa, last winter to study the epidemic of yellow fever, has recently communicated his observations to the Academy of Medicine. The first part of his report is devoted to the memory of the eminent scientists who succumbed there to the disease: Stokes, Young and Noguchi. The death of Noguchi is all the more regrettable because of the fact that the researches that he undertook have been abandoned, while all the monkeys inoculated by him have been allowed to die. They were valued at half a million francs ($19,500). Furthermore, the government of French West Africa has issued an order prohibiting the inoculation of the monkeys of the colony for fear that they may become adapted to the virus, and that, on escaping, which is a frequent event, they may serve to spread the infection. Pettit made use of a species of monkey of the genus *Macacus*, brought from India, and carried on his researches at the Institut Pasteur, using a virus from Senegal that was furnished him by Professor Sellards of Harvard University. His first conclusion is that the agent of yellow fever is not a spirochete, as Noguchi believed, but an invisible filtrable virus. That was the opinion advanced also by the Marchoux mission in 1903. This virus can be inoculated into monkeys, and the sick monkeys are cured by injecting into them the serum of a human being who has recovered from yellow fever. Pettit succeeded in preparing an attenuated virus that serves as an effective vaccine for the protection of monkeys. He has prepared 600 vials of this serum, which is a genuine protective and curative agent. It remains to be discovered whether the serum of these vaccinated monkeys will serve, in turn, as a vaccine for man. That is the problem with which Pettit is engaged at present, and in view of the results already secured, he feels that it is probable. His researches have been hindered through lack of monkeys, owing to an advance in price since they have been used in Europe for testicular grafts, and the funds at the disposal of the mission are now inadequate.

A Canadian Medical Mission at Nancy

A Canadian medical mission composed of thirty-nine members, which is making a study tour in Europe and is going to Rome to attend the International Congress of Tuberculosis, has arrived in Nancy, under the conduct of Dr. Elliott, president of the association; Dr. Wodehouse, secretary, and Dr. Evrot, associate director of the Comité français de propogande contre la tuberculose. The mission has visited the various antituberculosis organizations of Meurthe-et-Moselle: the Hôpital Villemin, including the dispensary; the Lay-Saint-Christophe Sanatorium, and the Flavigny Preventorium. The visit began with the Villemin Hospital-Sanatorium, where the Canadian

physicians were received by Prof. Jacques Parisot, president of the Office d'hygiène sociale de Meurthe-et-Moselle, who gave an account of the antituberculosis arrangements in Meurthe-et-Moselle, which may be regarded as having a model departmental organization. Since 1920, fourteen dispensaries have been established in Meurthe-et-Moselle, and the number of consultations, during the past six years, has increased from 1,649 to 26,880. Professor Parisot explained the practical relations between the hospital-sanatorium, the sanatorium and the preventorium. The department of Meurthe-et-Moselle has solved the problem, and typical figures show the effectiveness of the campaign that has been undertaken: in eight years, from 1920 to 1928, the mortality from tuberculosis has been reduced from 22 to 16 per 10,000 inhabitants.

The Practice of Medicine in Morocco

The practice of medicine in Morocco has recently been subjected to new regulations, the essential requirement being as follows: a practitioner must possess a diploma conferring on him the right to practice medicine in the country in which the diploma was given. Foreign practitioners may therefore settle in Morocco by virtue of the principle of free competition, which is the basis of the organization of the protectorate. The register of practitioners authorized to practice, as of Jan. 1, 1928, has just been published. In the French zone of Morocco there are 143 physicians, exclusive of the military physicians and physician charged with administrative functions. Of this number, 121 are French, while only twenty-two claim foreign degrees.

AUSTRALIA

(From Our Regular Correspondent)

Oct. 15, 1928.

Hospital Finance in Australia

The continual inadequacy of funds for public hospitals is reflected in the appeals for increased government grants and voluntary subscriptions and the shortage of bed accommodation. In New South Wales the minister for health recently stated in reply to a deputation that he could easily find immediate use for a million pounds in the liquidation of hospital overdrafts and the provision of urgently needed accommodation. In Queensland the situation is less formidable as a result of the financial benefit derived from a fortnightly state lottery that is conducted in the interests of medical charities. The tickets cost approximately $1 and the first prize is £5,000. In Victoria the shortage of hospital accommodation in the metropolis is acute. Analogous to the charity chest of some American cities, Melbourne has had for the past five years a central organization known as the lord mayor's fund, to which systematic contributions are made by all sections of the community and in the aid of which periodic "drives" are made. The total receipts for the fiscal year just concluded amounted to £61,642. This sum is distributed to the principal metropolitan hospitals on an equitable basis. During the past ten years the cost of maintenance of these hospitals has more than doubled. This is largely due to the increased bed accommodation.

It has been suggested that the state should increase the hospital grants by the Queensland system of a state lottery or by the imposition of an increased betting tax. The inauguration of the first of these suggestions is unlikely, as the temperament of the Victorian people differs from that of the Queenslander. In New South Wales, the entertainment tax method of raising money is favored, with a motor tax to provide for the treatment of the increasing motor casualties. It has been almost universally found that an increased government grant results in the dwindling of voluntary subscriptions with the establishment of a vicious circle, usually broken by the complete maintenance of the hospital from state or municipal funds. The grants per bed to hospitals by the respective state governments are: Victoria, £45; Western Australia, £83; New South Wales, £99; Queensland, £102; Tasmania, £105, and South Australia, £149.

Nursing Service for Isolated Districts in Victoria

A solution of the problem of providing nursing service for families which live in outlying settlements that are considerable distances from established medical and hospital organizations is afforded by the Victorian Bush Nursing Association. The bush nurse would seem to be synonymous with the American public health nurse. Inaugurated in 1911, the function of the association is to provide trained and resourceful nurses who will undertake general nursing, obstetric, first aid and child welfare work, give hygiene instruction to school children, and advise mothers on home sanitation and mothercraft. After eighteen years of work there are now fifty-nine bush nursing centers in the state, fourteen of them being hospital centers and twenty-one being provided with ambulances. The hospitals are mostly on a small scale; the largest and most recent contains only four wards and an operating theater. The obstetric records of the service are worthy of congratulation. During the past year, 792 patients were delivered without a single death. In 715 of these cases, antenatal supervision was exercised by the bush nurse, and this is considered the important factor in the excellent results obtained. The obstetric work of the association has been very favorably commented on by the director of obstetric research in Victoria, Dr. R. Marshal Allan. No special training center has as yet been established for the nurses, but selected general trained nurses undergo obstetric and child welfare training at the expense of the association. A recent development of the activities of the association is the provision of a "bush housekeeper," who will take domestic charge of a home during the absence of the mother in the hospital. The bush nurses cooperate with the medical practitioners, health agencies and established hospitals in their districts. The preventive aspect of their work is a feature of their valued functions.

JAPAN

(From Our Regular Correspondent)

Nov. 3, 1928.

In Honor of Prof. Dr. Moreilla

Prof. Dr. Moreilla, the Brazilian psychiatrist, arrived in Tokyo, September 13. He will stay here until December. The welcome meetings, receptions, and other activities of his stay were scheduled and arranged by the reception committee, Drs. Sato, Ishiwara, Saeki, Fujinami, Toda, and Miyajima. His lectures will be given in the Tokyo, Hokkaide, Tohoku, Kyote, Osaka and Kyushu universities. September 22, he and his wife were invited to the Kabukiza Theater in Tokyo, to see some original Japanese plays. One the 26th, he went to Hokkaido to see the village of the Ainus, and on October 5 he attended a dinner of welcome given in his honor at the Maple Club of Shiba, Tokyo. The address of welcome was delivered in German by Prof. Dr. Kure, and was replied to in Spanish by Dr. Moreilla. On the next evening the home minister's dinner was given in honor of him and his wife. He will visit numerous public and private hospitals, institutes and laboratories while here, and will leave Kobe by the S. S. *Kamo* for Germany, December 6.

Intestinal Worms and Vitamins

Under the direction of Drs. Saeki and Fujimaki, Mr. R. Sasaki, expert of the government dietetic laboratory, has made researches on the different varieties of intestinal worms and their connection with vitamins, which have recently been published. He has reached the following conclusions: (1) although infestation by worms is caused by ingesting them in some stage of their life cycle, the extent of infestation does not necessarily depend on the number ingested; (2) a lack of vitamins A and

D makes infestation easy; (3) a lack of vitamin B contributes to early infestation; (4) a lack of vitamin C lowers the rate of infestation, while an excess of vitamin C increases it, and (5) the fact that the rate of infestation is in proportion to the lack or excess of vitamins depends on the amount of bile that is secreted.

Personal Items

Dr. Y. Ishiwara, professor of pharmacology in the Tokyo Jikeikai Medical College, who has been with the Rockefeller Institute in America since April, 1926, returned to Tokyo, September 12. He toured Europe on his way home.

Dr. Yamada, surgeon general, accompanied by Surgeon Captain Kitano, who had been in China for a month to observe health conditions in the Chinese army, returned to Tokyo, October 2.

It is reported that Mrs. Yayoi Yoshioka, principal of the Woman's Medical College, Tokyo, who toured the United States after the close of the Pacific Women's Conference in Hawaii, in August, returned to Tokyo, October 22.

Dr. Iwahara, school health officer in the educational department, who arrived at Yokohama on the S. S. *Korea*, October 26, spent the spring and summer in Europe and America.

Dr. B. Koizumi, sanitary expert of the bureau of social affairs, and Dr. Y. Teruoka, director of the Kurashiki Labor Institute, have been appointed consulting members of the hygienic section of the League of Nations, in addition to Dr. J. Hoshini, sanitary officer of the metropolitan police bureau, who has been one of the members for several years.

The Chinese government appointed Mrs. Teng Hsu-ying director of the public health bureau, July 26. This is the first time in Chinese history that a woman physician has held an important government post.

The Recent Examination for Medical Practice

The last examination for medical practice was held by the educational department at the Tokyo Imperial University, October 10. Two Americans, Dr. Black and Dr. Letbetter, were among the successful candidates.

Health Films by the Home Ministry

The home ministry has prepared a motion picture film on venereal disease which is to be used in presenting general information on this subject to the public. Under the direction of Mr. Naito, health officer, photoplays are to be written by Mr. Tani and prepared for use in the prevention of tuberculosis and parasitic diseases.

Government Commendation of Physicians

During the recent coronation ceremonies of the emperor, Drs. Hayashi and Yokote, professors in the medical department of the Tokyo Imperial University, Dr. Araki, president of the Kyoto Imperial University, and Dr. Morijima, professor in the Kyoto University, received official commendation for more than thirty years of continuous service in medical education in their universities.

Medical Meetings

SCHOOL PHYSICIANS CONFERENCE IN MANCHURIA

Under the auspices of the South Manchurian Railway Company, a conference was held by the school physicians from Manchuria and Chosen, September 19-21. Several famous physicians from Japan attended it. The general health of the school children and teachers, and athletics, were the main topics discussed.

MEETING OF THE CHOSEN MEDICAL SOCIETY

The general meeting of the Chosen Medical Society was held in the Keijo Medical College, Keijo, September 21-23. The opening address was delivered by President Shiga of the college, after which Dr. C. Muto was given the special encouragement prize for his scientific researches, "On the Excretory Route of the Testicular Hormone." Afterward several members read papers, and the meeting was concluded successfully.

MEETING OF THE JAPAN SOCIETY OF INFECTIOUS DISEASES

September 22, the Japan Society of Infectious Diseases held its conference in the Imperial University, Tokyo. The following papers were read: "Epidemic Cerebrospinal Meningitis," by Dr. T. Nagayo; "Hemolytic Streptococci," by Dr. R. Kobayashi; "Fever," by Dr. F. Ishiwara. Drs. Nagasawa, Shimasono, Nishizawa and Miyakawa discussed Dr. Nagayo's paper, after which Dr. Sakaki commented on the paper by Dr. Ishiwara.

MEETING OF THE JAPAN FORENSIC MEDICAL SOCIETY

The thirteenth general meeting of the Japan Forensic Medical Society was held in the Tohoku Imperial University, Sendai, September 23-24. After the opening address by President Ishikawa, Dr. Mita, professor in the Tokyo Imperial University, was seated as chairman. Dr. Jimbo from the Hokkaido then read his paper on "Poisoning by Phosphorus and Oxygen in the Blood," which was followed by discussion and debate, and more than thirty other valuable papers and reports. The second day was quite as successful. It was decided to hold the next session in the Hokkaido Imperial University at Sapporo, Hokkaido, in June, 1929. Two future themes are "Type Specificity of the Human Tissues and Body Forces," by Dr. H. Asada for 1929, and "Inheritance Form of Human Blood Types," by Dr. T. Furukata for 1930.

MEETING OF THE KYUSHU MEDICAL SOCIETY

The thirty-second general meeting of the Kyushu Medical Society was held in the city of Miyazaki, Kyushu, October 13-14. Although the city is situated rather far from the Kyushu Imperial University (being near the mountain, according to the legend, on which the heavenly tribe of Japan first settled), more than 700 members and several medical students from China attended the meeting.

NETHERLANDS

(From Our Regular Correspondent)

Sept. 16, 1928.

The Anopheles Mosquito in Relation to Animal Distribution

During the antimosquito campaign carried out under the auspices of the Rockefeller Foundation in the region of Medemblick, observations were made by Swellengrebel and De Rook in three group areas, all of which contained pig-pens but in different proportions. Group 1 was an area in the center of the city, in which antilarval measures were enforced; group 2 was in an open pasture region, and group 3 was in an adjacent village beyond the application of protective regulations. The number of anopheles mosquitoes caught in the pig-pens of the three groups is expressed in relation to the square meters of the surface of the soil and the number of pigs housed in the pens. The mosquitoes were caught between June and September.

Although the deposits of larvae were found to be numerous in group 3 (seven pig-pens) and rare in group 2 (three pig-pens), more mosquitoes were found in group 2 than in group 3 (an average of 1,149 mosquitoes per pig, during the second half of the month of August). Swellengrebel and De Rook discovered that "with the total number of anopheles mosquitoes in a given region remaining the same, the number per animal increases with the lowering of the density of the population."

They think that similar observations will be made when the Zuider Zee in the Netherlands has been drained. There will not be such an abundance of larvae, but such as there are will be found in the regions with scattered dwellings, with little or no protection, at the start, from the stables or outbuildings. They fear, therefore, an increased incidence of malaria after

the vast area has been drained—at least, during the first years of the cultivation of the new terrain.

The authors mention also the results of their experiments to test the range of flight of anopheles mosquitoes, 1,500 female *Anopheles maculipennis* colored with methylthionine chloride having been liberated. Seventeen were recaptured, one at a distance of 1,600 meters from the point of departure, eleven at 1,850 meters, one at 2,250 meters, and four at 3,000 meters.

Opening of an Electric Milk-Pasteurizing Plant in Amsterdam

The Netherlands organization of milk producers has established in Amsterdam an electric milk-pasteurizing plant, which was planned by Profs. A. H. W. Aten and Dr. Lulofs. The beginning processes of pasteurization are the same as in any pasteurization plant. The pasteurization, however, is effected by an electric current applied to the milk by electrodes across which a voltage of 3,000 is impressed. The raw milk is put in a reservoir, and afterward is pumped through pipes in which it passes by the electrodes. Thence it is collected in a reservoir for the pasteurized milk, which is heated to a temperature of 86 C. By regulation of the flow of the current, the temperature is kept automatically constant. If, by chance, the mechanism controlling the flow of current should get out of order, the current would be automatically shut off, and the milk as yet but incompletely pasteurized would be automatically returned to a reservoir for raw milk, by passing through a three-way cock. The fact that pasteurization takes place at an even temperature is of great importance. The electric apparatus may be regarded as a distinct advance in the preparation and handling of milk.

Postvaccinal Encephalitis

Mention has already been made of the events that succeeded the appearance of a number of cases of encephalitis following vaccination against smallpox. Here are some of the recent statistical figures on the subject: The total number of cases of encephalitis developing in the Netherlands as a result of vaccinations performed during the first quarter of 1928 was two, with one death. During the first quarter of 1927 there were eighteen cases, with seven deaths. The quantities of vaccine delivered during the periods cited were sufficient for the vaccination of 43,715 persons (first quarter, 1928) and 99,236 persons (first quarter, 1927).

To understand the full significance of these figures, it would be necessary to know exactly the number of children inoculated with the vaccine. It may, however, be reasonably assumed that, during the first quarter of the present year, by reason of the temporary suppression of compulsory vaccination, fewer children were vaccinated than during the previous year. The number of vaccinations performed each month is not published, the statistics furnishing information only on the total annual vaccinations in each commune. Instructions have been issued to the municipalities to secure the monthly figures for the last three years. Not until this work of compilation has been completed can any exact idea of the whole situation be obtained.

Welfare Work Among the Infirm and the Abandoned

In the Netherlands, two societies are engaged in alleviating the sufferings of the infirm and the abandoned; namely, the Vereeniging voor mismaakten in Leiden, and the Centrale vereeniging voor lichamelyk gebrekkigen. In addition, the Green Cross societies and the Rotary Clubs collaborate in this difficult work. The commune of Emmen has a consultation bureau for the infirm and the abandoned, which has given good results. One hundred patients are enrolled, eight of whom belong, strictly speaking, in the domain of orthopedic surgery. The Netherlands has also three hostels that admit the infirm: the Johannastichtung at Arnhem, the Adriaanstichting at Hilligersberg, and the Corneliastichting at Beesterzwaag. The Johannastichting was founded in 1900, and has twenty beds for boys and seventeen beds for girls. The Adriaanstichting, founded in 1912, has more than forty beds. The Corneliastichting is of recent origin, and cares for sick and weakly children.

The Milk Control Center in Amsterdam

The milk control center in Amsterdam was established in 1926 with the aid of two grange societies, together with subsidies granted by the city. The efforts of the 600 members will be sure to effect great progress. These 600 members are the owners of more than 12,000 cows, which represents more than half of the cows that supply milk for Amsterdam. Many members, through the aid of the milk control center, have become subscribers for the distribution of water and of electric current, while cleanliness has become a watchword. Of 400 stables that have been controlled, 50 per cent have remained free of the streptococcus. The butter fat content of milk has improved. Veterinarians examined, in 1927, 14,800 cows. The courses given in better milk production have awakened great interest. During the coming season, twelve such courses will be given. Professors of rural economy will give a number of theoretical lectures. An attempt is being made to eliminate from the herds all cows affected with open tuberculosis. A special film has been prepared to illustrate the hygiene of man and animals.

Dedication of the Boerhaave Quarter in Leiden

Minister Wasznik presided recently at the dedication of the new academic hospital in Leiden. A large number of invited guests convened for the occasion in the Great Hall of the hospital. The clinics have been completed and can be used in a few months, so that, by the beginning of the new school year, the whole corps of the faculty of medicine will be able to move to the Boerhaave Quarter. This is a unique institution for the Netherlands, and marks a distinct advance in the field of medicine.

New Regulations Pertaining to Cheese

July 1, 1928, the new regulations pertaining to cheese went into effect: 1. The percentage of fats in dry cheese must not be lower than that indicated on the wrapper. 2. Cheese must not contain other than milk fats. 3. Cheese must be clean and wholesome. 4. Cheese may not contain harmful ingredients. 5. No substance other than sodium chloride may be used for the conservation of cheese. 6. Foreign substances, with the exception of spices, small quantities of potassium nitrate (saltpeter) and calcium salts, and a small quantity of harmless glazing, are prohibited in cheese.

BERLIN

(From Our Regular Correspondent)

Oct. 27, 1928.

The Hamburg Session of German Scientists and Physicians

At the recent Hamburg session of German scientists and physicians, Prof. A. Gottstein of Berlin and Professor Gotschlich of Heidelberg discussed the rise and fall of epidemics. Of the peculiar features that characterize epidemics, as compared with the manifestations of ordinary diseases, Gottstein emphasized their sudden appearance and decline, their return at regular or irregular intervals, the sudden appearance of new forms and the gradual disappearance of old forms of epidemic disease, the changes in character, and the frequent concurrence with national or international catastrophes, such as wars and famines. In recent years, Germany has experienced many new phenomena: a low incidence of war epidemics in spite of the favorable conditions for their spread; the absence of epidemics during the postwar period in spite of numerous cases brought across the borders owing to the breakdown of the public health services; the low incidence of scarlet fever and diphtheria in spite of the shortage of houses, and the bad economic situation.

On the other hand, there were unusually severe epidemics in Russia in 1920-1921, the upward shoot of the curve of tuberculosis mortality in Germany during the height of the food scarcity was short, the mortality from the influenza epidemic in 1918 was deplorably high, epidemic meningitis appeared, and there were severe local outbreaks of typhoid.

The nature of these events has become clearer through the now generally accepted view that the decisive factor for the outbreak of an epidemic is the interrelation between the specific causative agent and the receptivity of the menaced organism. The two factors fluctuate in their degree of potency, so that if for a time there is a marked preponderance of the one factor, a weaker potency of the other will suffice to precipitate the pathologic process. Great importance is attached to germ carriers who do not develop an infection themselves. It is assumed that, if there is constant contact with a widely disseminated causative agent, a gradually increasing nonreceptivity is produced by the repeated defense reactions. Clinical experience, experimentation and statistics show that manifold influences increase the susceptibility to the causative agent and may exert an unfavorable influence on the course and the outcome of an infection; for example, nutritional, climatic or age factors, and preceding diseases.

A better understanding of the relationships is obtained by consideration of certain factors proposed by the theory of hereditary transmission: the phenotype and the genotype. Every process is the result of the combined influences of environment and hereditary predispositions, in which, of course, there are many factors contending for supremacy. The majority of endemic outbreaks are typical processes, dystentery and itch, for example, affecting chiefly the lower classes, and the economic condition influencing the incidence, course and outcome of tuberculosis. It is justifiable to regard as primary an impairment of the constitution, which disturbs the equilibrium between the causative agents ever present and the human beings constantly menaced by them, in favor of the former. In addition to these phenotypic processes there is a constant potential relation between the various species of animals and several races of man, on the one hand, and the specific morbific agents that attack them. Occasionally the relation becomes such that certain animal species become absolutely impotent in the face of violent attacks by specific morbific agents, although in the relations between man and human parasites the morbific agents ordinarily are only mildly successful in breaking down man's resistance. It has occasionally been observed that organisms which have infested a certain host for thousands of years cease to be such a menace for the new generations of the host, owing to the fact that the weakest members of the host species have been gradually eradicated while the others have gradually developed resistance until it has become a natural immunity to the organism. This constitutes a congenital nonsusceptibility which is not transmissible through hereditary influence but is obtained by surmounting the effects of epidemic diseases or by artificial immunization.

The relationships of these two kinds of immunity serve to explain, in a measure, the periodic fluctuations of epidemics. This applies to measles and diphtheria. Diphtheria epidemics show, in addition to smaller, phenotypic fluctuations, periods extending over several decades and comprising the lifetime of more than one generation. For the understanding of these phenomena, the destruction of especially weak strains must be postulated, which finds corroboration in the recently demonstrated familial disposition, for which also serologic proof has been obtained. Epidemics have been rightfully called preventable diseases. The continued and marked decrease of general mortality during the past fifty years, which finds no counterpart in the demographic statistics of recent centuries, is due mainly to the retrogression of epidemics. To be sure, the progress in hygiene, bacteriology and medicine and the general uplift of cultural conditions among the people have contributed to this result. Owing to causes beyond human control, new epidemics of a catastrophic nature break out occasionally and quite unexpectedly. Nevertheless, mankind must continue on the same road of progress, and this can be attained only if the government measures of defense against epidemics, based on scientific research, are strengthened and protected by a recognition of the solidarity of all strata of society and a sense of responsibility on the part of every component member.

Prof. Dr. Gotschlich, the prodean of the faculty of medicine of the University of Heidelberg, supplemented the address of Gottstein by the following observations: For the investigation of the mode of onset of epidemics, the most characteristic feature of which has always been their often sudden appearance and disappearance, two methods are available: the epidemiologic-statistical method, which seeks to deduce their general "laws" from the observation of their various manifestations, and, secondly, the etiologic method, which endeavors to interpret the aspects of an epidemic from the properties of the causative agent. Half a century ago, before the discovery of morbific agents, the statistical method presented the sole means of investigation with regard to the spread of epidemics. It has since then received valuable support from the etiologic method, but it has not been supplanted by the latter. In modern epidemiology the two trends of research supplement each other, in which arrangement the statistical method has imposed on it the task of stating the problems, while the etiologic method is expected to solve them: on the one hand, inductive (analytic) epidemiology; on the other hand, deductive (synthetic) epidemiology. From a common consideration of both points of view, experimental epidemiology, in which English and American investigators have been foremost, has been developed. By animal experimentation, which presupposes the use of a vast number of experimental animals, which are brought together under approximately the same living conditions under which human beings live (the mouse village, for example), the modes of onset and the spread of epidemics are studied.

The latest knowledge of causal relations presents many new aspects of the problem of epidemics. The relation between the morbific agent and the susceptibility of man is not an unvarying relation. The morbific agents and also the predisposition to disease are subject to variation in potency. In addition, not only the external conditions of contagion (source of contagion, mode of transmission of the virus, portal of entry) but also the quantity of micro-organisms that have penetrated the living tissues play an important rôle in the infection of a single individual and in the vast onward movement of an epidemic. The speaker referred to examples of epidemics in recent years and in olden times to illustrate the mode of onset, the final disappearance, and the changes in the clinical picture of epidemics in the course of centuries, manifestations that he explained as due to the variability in the causative agents and in the predisposition of the population. In the quantitative fluctuations in the spread of epidemics, a distinction must be made between fluctuations of a periodic and those not of a periodic nature. The former depend especially on the course of the seasons, which influence in an unequal way the external conditions of contagion, and the relative predisposition of man. In the fluctuations not of a periodic nature (so-called secular fluctuations), the effects of natural events and of social conditions must be considered. The transmission of epidemic diseases through the air has never been definitely established, and it may be assumed that direct contact is necessary. Epidemics never travel faster than the individuals who are subject to their attacks—whether on sea or on land. If, as yet, all the problems of the rise and fall of epidemics cannot be fully explained, that is due not so much to the inherent difficulties of the subject as to the extraordinarily complex nature of epidemiologic relationships.

Marriages

ERNEST D. DAVIS, JR., Lieut. (j. g.), M. C., U. S. Navy, Washington, D. C., to Miss Harriet Clarke of Covington, Va., in October.

WILLIAM EDWIN DICKERSON, Princeton, W. Va., to Miss Norma Arline Bird of Rock, September 22.

JAMES MOREHEAD WHITFIELD, JR., Richmond, Va., to Miss Charlotte Gibbs of Woodstock, November 7.

SAUNDERS ROBERT JORDAN, Pleasant Garden, N. C., to Mrs. Annie Belle Fields of Greensboro, recently.

ALPHEUS HARTLEY WOOD, Emporia, Va., to Miss Madge Moline Kessler of New Castle, October 8.

OTIS N. SHELTON, Charlottesville, Va., to Miss Ruth Blackwell of Roanoke, September 26.

WILLIAM JOHN REDDY to Miss Mary Ryan, both of Johnstown, Pa., November 24.

JOHN F. RALSTON to Miss Irene Isobelle Phillips, both of Cleveland, November 3.

BASIL R. BELTRAN to Miss Mary Lyons, both of Philadelphia, October 27.

Deaths

Emilius Clark Dudley, Chicago; Long Island College Hospital, Brooklyn, 1875; professor emeritus of gynecology, Northwestern University Medical School; in 1922 visiting professor, Hunan-Yale College of Medicine, Changsha, China, and the Peking Union Medical College, Peking, China; member of the Illinois State Medical Society; past president of the American Gynecological Association; formerly member of the board of education of Chicago; served during the World War; consulting gynecologist to St. Luke's Hospital; author of "Principles and Practice of Gynecology"; aged 78; died, December 1, of cerebral hemorrhage.

Lewis Harlow Taylor ✠ Wilkes-Barre, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1880; member of the American Academy of Ophthalmology and Oto-Laryngology, the American Ophthalmological Society and the American Otological Society; at one time medical inspector of the state board of health; on the staff of the Wilkes Barre General Hospital, and formerly on the staff of the Mercy Hospital; aged 78; died, November 5, of coronary occlusion.

Clarence Benson Wood ✠ Los Angeles; New York Homeopathic Medical College and Hospital, 1903; member of the Pacific Coast Oto-Ophthalmological Society; professor of clinical surgery (otology and laryngology), College of Medical Evangelists; on the staff of the Los Angeles County General Hospital; aged 52; died, October 23.

Henry Ostroff ✠ San Francisco; Central College of Physicians and Surgeons, Indianapolis, 1897; formerly secretary of the Washoe County (Nev.) Medical Society; served during the World War; on the staffs of the Stanford University and St. Joseph's hospitals; aged 65; died, November 11, of sclerosis of the coronary artery.

Cornelius C. Laffer ✠ Meadville, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1893; formerly secretary of the Crawford County Medical Society; for many years school physician; at one time member and president of the board of health; aged 61; died, October 12, of cerebral hemorrhage.

A. Marshall Burt, Charlton, N. Y.; Albany Medical College, 1889; member of the Medical Society of the State of New York; health officer of Charlton; formerly health officer of Charleston, Fultonville and Glen; aged 66; died suddenly, October 27, of coronary thrombosis and chronic prostatitis.

Reuben Boyd Miller ✠ Colonel, M. C., U. S. Army, Washington, D. C.; Detroit College of Medicine and Surgery, 1893; entered the regular army in 1901; advanced through the various grades to that of colonel in 1927; aged 57; died, November 7, at the Walter Reed General Hospital, of pneumonia.

Marshall B. Newhouse, Marion, Ohio; Northwestern Ohio Medical College, Toledo, 1885; member of the Ohio State Medical Association; on the staff of the Marion City Hospital; aged 72; died, in October, at the Flower Hospital, Toledo, of injuries received in an automobile accident.

Edward Thomas Higgins, New York; Bellevue Hospital Medical College, New York, 1897; served during the World War; for more than twenty years chief surgeon and surgeon for the police department; aged 53; died, October 31, of cerebral hemorrhage.

Wilfrid Francois Milot, Attleboro, Mass.; Baltimore Medical College, 1900; member of the Massachusetts Medical Society; served during the World War; on the staff of the Sturdy Memorial Hospital; aged 58; died, October 19, of angina pectoris.

Cornelius Arthur Leenheer ✠ Chicago; Harvey Medical College, Chicago, 1901; University of Illinois College of Medicine, Chicago, 1909; aged 52; died, November 23, at the Chicago Memorial Hospital, of heart disease and pneumonia, following influenza.

John N. Day, Jr., Alma, Mich.; Detroit College of Medicine and Surgery, 1893; member of the Michigan State Medical Society; aged 63; on the staff of the Carney Hospital, where he died, November 8, of injuries received in an automobile accident.

Josiah Clark Hubbard ✠ Holyoke, Mass.; Jefferson Medical College of Philadelphia, 1880; formerly on the staff of the Providence Hospital and superintendent of the Holyoke Hospital; aged 75; died, October 1, of carcinoma of the liver.

Charles Marion Abbott, Pine Grove, La.; Memphis (Tenn.) Hospital Medical College, 1902; aged 47; died, August 18, at the Touro Infirmary, New Orleans, of cerebral hemorrhage, chronic nephritis and cerebral arteriosclerosis.

James Constantine Jensen, Hendricks, Minn.; University of Minnesota Medical School, Minneapolis, 1903; formerly on the staff of the Hendricks Hospital; aged 52; died, October 22, in a hospital at Canby, of pneumonia following influenza.

J. Maseique Beausoleil, Montreal, Que., Canada; University of Montreal Faculty of Medicine, 1880; formerly on the faculty of his alma mater; aged 73; died, September 11, at his summer home in St. Jean de Matha, of heart disease.

William Claiborne Powell, Petersburg, Va.; Medical College of Virginia, Richmond, 1901; member of the Medical Society of Virginia; on the staff of the Petersburg Hospital; aged 58; died, October 21, of chronic myocarditis.

Charles Henneberry Mulroney, Hampton Roads, Va.; Rush Medical College, Chicago, 1900; served during the World War; on the staff of the National Soldiers' Home; aged 53; died, October 7, of heart disease.

Allan Patrick McCabe, Strathroy, Ont., Canada; University of Western Ontario Medical School, London, 1924; served during the World War; aged 33; died, July 20, following an operation for appendicitis.

Francis Alfred Happe, Danbury, Iowa; State University of Iowa College of Medicine, Iowa City, 1905; aged 50; died, April 9, at the Clarkson Hospital, Omaha, following an operation for gallbladder disease.

James A. Larrabee, Barnard, Mo.; College of Physicians and Surgeons, Keokuk, Iowa, 1881; Bellevue Hospital Medical College, New York, 1891; aged 72; died, November 7, in St. Joseph, of pneumonia.

Everett Charles Hartley, Sr., Carver, Minn.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1877; Chicago Medical College, 1879; aged 72; died, September 19, of coronary thrombosis.

Frank Burton, Minneapolis; Albany (N. Y.) Medical College, 1882; aged 75; died, October 19, at the Northwestern Hospital, of bronchopneumonia, chronic myocarditis and hypertrophy of the prostate.

William Royston Betts, New York; Medical Department of the Tulane University of Louisiana, New Orleans, 1894; aged 64; died, October 31, at his home in Passaic, N. J., of angina pectoris.

S. Nelson Wiley, St. Louis; Jefferson Medical College of Philadelphia, 1879; member of the Medical Society of the State of Pennsylvania; aged 77; died, July 6, of chronic myocarditis and nephritis.

Abram Walter Trigg, West Blocton, Ala.; Medical College of Alabama, Mobile, 1881; member of the Medical Association of the State of Alabama; aged 75; died, October 4, of cerebral hemorrhage.

William John Smith, Brampton, Ont., Canada; University of Toronto Faculty of Medicine, 1905; aged 55; died, September 17, as the result of injuries received in an automobile accident.

Bolivar Thomas Jones, Geiger, Ala.; Medical College of Alabama, Mobile, 1886; Bellevue Hospital Medical College, New York, 1889; aged 66; died, July 23, of carcinoma of the stomach.

Harvey Hugh Funk, Beverly, Ohio; Bellevue Hospital Medical College, New York, 1883; member of the Ohio State Medical Association; aged 69; died, September 22, of angina pectoris.

Joseph O. Reed, Washington, D. C.; Medical Department of Columbian University, Washington, 1894; aged 75; died, October 27, at the Emergency Hospital, of a self-inflicted bullet wound.

Carl Rubach, Evergreen, Ala.; Memphis (Tenn.) Hospital Medical College, 1894; aged 62; died, October 16, at the Gartley-Ramsey Hospital, Memphis, Tenn., of cerebral hemorrhage.

Julius Rosenberg, New York; Medical Department of Columbia College, New York, 1890; aged 70; died, October 6, of chronic arthritis, arteriosclerosis and cerebral hemorrhage.

Jacob R. Lang, Evansville, Ind.; Hahnemann Medical College and Hospital, Chicago, 1887; aged 69; died, November 10, in the Louisville (Ky.) Hospital, of cerebral hemorrhage.

Jeptha Ellsworth Pitsnogle, Hagerstown, Md.; University of Maryland School of Medicine, Baltimore, 1889; formerly county health officer; aged 65; died, in September.

Albert James Roberts, Olive Branch, La.; Medical Department University of Louisiana, New Orleans, 1868; aged 82; died, October 28, of chronic endocarditis and nephritis.

George Fish Clark, Brooklyn; Hahnemann Medical College and Hospital of Philadelphia, 1890; aged 62; died, February 23, at the U. S. Naval Hospital, of cirrhosis of the liver.

Jesse S. Bardin ✙ Fort Worth, Texas; Fort Worth School of Medicine, 1907; aged 52; died, September 22, at the All Saints Hospital, following an operation for gallstones.

Allan Boyd Earl, Hamilton, Ont., Canada; Queen's Faculty of Medicine, Kingston, 1915; served with the Canadian Army during the World War; aged 38; died, July 26.

Horace Henry Choate, Worcester, Mass.; Baltimore University School of Medicine, 1899; aged 67; died, October 28, of injuries received in a recent automobile accident.

Lois D. Matthews Innes Schroers, West Palm Beach, Fla.; St. Louis College of Physicians and Surgeons, 1911; aged 47; died, November 3, of heart disease.

D. Smith Wisehart, Decatur, Ill.; Medical College of Ohio, Cincinnati, 1879; aged 75; died, February 21, at the Masonic Home, Sullivan, of gastric ulcer.

James Ebenezer McAdams, Morristown, S. D.; Rush Medical College, Chicago, 1885; aged 71; died, October 31, in San Francisco, of chronic nephritis.

William S. James, Cleveland; Columbus (Ohio) Medical College, 1891; aged 69; died, August 24, at the Fairview Park Hospital, of carcinoma of the sigmoid.

John Neil Cox, Rio, Ill.; Medical Department of the University of Wooster, Cleveland, 1889; aged 71; died, August 17, at the Cottage Hospital, Galesburg.

Nora A. Donahoe, Dallas, Texas; Hering Medical College, Chicago, 1902; aged 56; died, November 8, at St. Mary's Hospital, Decatur, Ill., of osteomyelitis.

James William Germer ✙ Chicago; Northwestern University Medical School, Chicago, 1900; aged 56; died, November 13, of myocarditis ad nephritis.

Marshall F. Leland, Cincinnati; Western Reserve University School of Medicine, Cleveland, 1893; aged 59; died, April 8, of cerebral hemorrhage.

Paul Bruce Vosburg, Granville, Iowa; Northwestern University Medical School, Chicago, 1892; aged 61; died, April 9, of chronic valvular heart disease.

Harvey Warner Lloyd ✙ Starford, Pa.; Medico-Chirurgical College of Philadelphia, 1910; aged 40; died, September 15, of pancreatitis.

Samuel Ellis Nowry, Dover, Del.; Medical Department of the University of the City of New York, 1889; aged 69; died, October 20, of pneumonia.

Samuel Jones Herrick, Long Beach, Calif.; Ensworth Medical College, St. Joseph, Mo., 1892; aged 66; died, November 3, of angina pectoris.

Edward L. Thomas, Wadesboro, N. C.; Leonard Medical School, Raleigh, 1905; aged 47; died, May 15, at Charlotte, of carcinoma of the tongue.

Oliver H. Donaldson, Chicago; College of Physicians and Surgeons, Chicago, 1894; aged 58; died, September 13, of organic heart disease.

Charles G. Pieck, Covington, Ky.; Medical College of Ohio, Cincinnati, 1889; aged 67; died, October 31, of uremia.

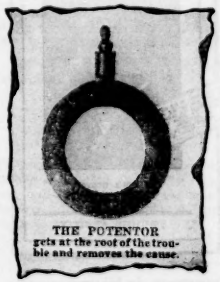
Bureau of Investigation

THE POTENTOR FRAUD

The United States Mails Are Closed to Julius Saur

In the latter part of 1925, physicians were receiving from one Julius Saur, who called himself an "importer" and did business from 17 West Forty-Second Street, New York City, a form-letter and a circular dealing with a device known as the "Potentor." The Potentor was a small hollow rubber ring with an air valve attached to it. It was sold as a device that would produce sexual rejuvenation in the male. In January, 1926, Saur was circularizing the public and assuring them that "rejuvenation is no longer a dream, but an accomplished fact and within easy reach of all." The problem, according to Saur, had been "solved in an ideal manner by the ingenious invention of the well-known nerve specialist, Dr. Kratzenstein, called the Potentor."

By September, 1927, Saur had branched out and was conducting his business from Grand Central Palace, 247 Park Avenue, New York City. His stationery gave, as references, the Guaranty Trust Company of New York and the Bowery Savings Bank of the same city. Saur had also added to his bag of tricks a salve that he called "Triunqus," which was to be applied locally to the penis at the time the Potentor was worn. By 1928 Saur was doing a still larger business, and notified those on his "sucker list" that he had "completed arrangements to sell the famous remedies of Dr. Eric C. Beck, the well-known European specialist for genito-urinary disease, kidney, bladder and prostate trouble, nervous debility and sexual weakness." The Beck nostrum comprised four preparations — "Rejuvenator Tablets," "Exhilarator Tablets," "Auxilarator Tablets" and "Regulator Tea." These four products constituted a "treatment" and sold for $9 and there were twelve coupons given away with each nine dollars' worth. When one had accumulated 24 coupons, he was entitled to a free gift of a Potentor, the regular retail price of which was $10.



THE POTENTOR
gets at the root of the trouble and removes the cause.

A layman in a small town in Kansas wrote to the American Medical Association in May, 1928, stating that he had tried the Saur Potentor on a ten-day guarantee or money back, and returned the device and asked for the return of the money. He complained, however, that Saur not only did not return his money, but didn't even write to him. Soon thereafter, however, he began receiving letters and literature from the Liberty Trading Company, 123 Liberty Street, New York City. He said there was a sticker over the return address on the envelope and, when he soaked the sticker off the envelope, he found the name of Julius Saur underneath. The same layman expressed the opinion that there was a tie-up of some sort between Julius Saur and Hazen A. Horton of Marshall, Michigan, as Horton had advised him to use Saur's device at the same time that he was using his (Horton's) medicine. Horton has dealt in a variety of mail-order schemes—"pile cures," "Ox-O External Treatment for weak men," etc.

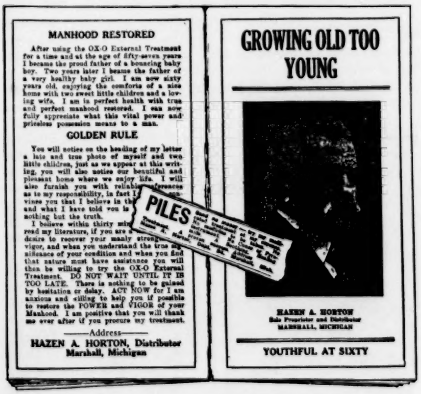
In February, 1928, the Post Office Department called on Julius Saur to show cause by March 9 why a fraud order should not be issued against him. On March 6, an attorney, George N. Jesse of New York City, transmitted to the Post Office Department a formal answer, signed by Saur, denying the charges. The Solicitor of the Post Office Department, after examining all the evidence in the case, submitted a memorandum to the Postmaster-General, detailing the essential facts and declaring that, in his opinion, Saur was operating a scheme for obtaining money through the mails by means of false and

fraudulent pretenses, representations and promises, and recommending that a fraud order be issued. As a result, the Postmaster-General issued a fraud order on March 20, 1928, closing the mails to Julius Saur.

THE HAZEN A. HORTON FRAUD

Another Sexual Rejuvenation Swindle Debarred from the Mails

Hazen A. Horton of Marshall, Michigan, has been quacking it for many years, using the United States mails as the intermediary for his operations. The mills of the gods grind slowly, but finally the postal authorities got around to Mr. Horton, and on November 9, 1928, closed the mails to this quack. Many years ago Horton was in the mail-order "pile cure" game. He has also operated a matrimonial agency. His more recent excursions in the field of medical fakery consisted in the sale of medicaments and a device for the alleged sexual rejuvenation of the male. His later activities are well described by the


MANHOOD RESTORED

After using the OX-O External Treatment for a time and at the age of fifty-seven years I became the proud father of a bouncing baby boy. Two years later I became the father of a very healthy baby girl. I am now sixty years old, enjoying the comforts of a nice home with two sweet little children and a loving wife. I am in perfect health with true and perfect manhood restored. I can now fully appreciate what this vital power and priceless possession means to a man.

GOLDEN RULE

You will notice on the heading of my letter a late and true photo of myself and two little children, just as we appear at this writing, you will also notice our beautiful and pleasant home where we enjoy life. I will also furnish you with satisfactory references as to my responsibility, in fact I [illegible] convince you that I believe in the Golden Rule and what I have told you is the truth, nothing but the truth.

I believe within thirty [illegible] read my literature, if you are [illegible] desire to recover your manly [illegible] vigor, and when you understand the true [illegible] seriousness of your condition and when you find that nature must have assistance you will then be willing to try the OX-O External Treatment. DO NOT WAIT UNTIL IT IS TOO LATE. There is nothing to be gained by hesitation or delay. ACT NOW for I am anxious and willing to help you if possible to restore the POWER and VIGOR of your Manhood. I am positive that you will thank me ever after if you procure my treatment.

Address—
HAZEN A. HORTON, Distributor
Marshall, Michigan

GROWING OLD TOO YOUNG

PILES

HAZEN A. HORTON
Sole Proprietor and Distributor
MARSHALL, MICHIGAN

YOUTHFUL AT SIXTY

Solicitor for the Post Office Department, in his memorandum to the Postmaster General, recommending the issuance of a fraud order. To quote:

"Hazen A. Horton, age about 68 years, has been engaged in the operation of various mail-order enterprises for approximately twenty years. For the greater portion of the period mentioned, he conducted a matrimonial agency, following which he undertook the sale of a preparation called the Ox-O External Treatment, under representations to the effect that it would cure lost manhood, prostate trouble and other genito-urinary ailments. The Ox-O External Treatment consisted of a mixture of vaseline, capsicum and menthol, rubbed about the penis close to the body. The alternate warmth and cooling sensation thus produced was alleged to be indicative of the efficacy of the remedy and of the need for more. Horton claimed to have recovered his own manhood by the use of this treatment. The cost of this product to Mr. Horton, including overhead, was ten cents a box. It was sold by him for two dollars a box.

"In February, 1923, Horton was indicted in connection with the operation of the Ox-O External enterprise and in March of the same year entered a plea of guilty and was fined $1,000. Shortly thereafter, he voluntarily filed with this Department an affidavit in which he promised to absolutely discontinue and abandon the business in question and return to senders all remittances thereafter received in connection therewith. In the affidavit mentioned, Horton stated further that he would not in future resume the enterprise agreed to be abandoned or operate 'any other business of like character.' Almost immediately, however, he inaugurated a scheme for the sale of a preparation called 'Horton's Pile Treatment.' As with his Ox-O External Treatment, he also claimed to have himself been cured by the use of this remedy.

"Sometime in 1925, in disregard of the provisions of the affidavit hereinbefore mentioned, Horton again started the sale of a 'treatment' for impotence and genito-urinary disorders in general. At first this 'treatment' consisted of two types of reddish tablets called, respectively, 'Kori' and 'Nervo.' Later, a small pneumatic ring, called, variously, the 'Potentor' and the 'New Day Improved Appliance,' to be worn around the scrotum and penis, was added. Again Horton claimed to have been personally cured of the ailments for which he was marketing these products."

The government, in collecting evidence against Horton, purchased boxes of Kori and Nervo, as well as his New Day Improved Appliance. The Kori tablets contained hexamethylenamine, corn silk, pichi, uva ursi and buchu, while the Nervo tablets contained asafetida, ferrous bromide, hyoscyamus, nux vomica and zinc phosphide. The Solicitor's memorandum then continues:

"The evidence before me shows that the representations made by Horton, to the effect that, when used as directed, Kori and Nervo will cure kidney, bladder, prostate and nervous disorders, that they will purify and enrich the blood and restore lost health, strength and vitality, and that the New Day Improved Appliance, by exercising an elastic pressure on the spermatic cord, will cause the testes to receive an increased blood supply, get better nourishment and produce a greater quantity of hormones, thereby restoring lost manhood and rejuvenating the body in general, 'without an operation,' are false and fraudulent, and I so find.

"The evidence shows that Horton is not a physician and has no medical training, his education being limited to that obtained in an ordinary country school. Despite the claims made by him for his preparations and device, it was admitted by Mr. Randall, his representative at the hearing before this office, that Horton himself is a 'physical wreck,' despite the fact that he has used his own preparations and device.

"The evidence shows, and I so find, that this is a scheme for obtaining money through the mails by means of false and fraudulent pretenses, representations and promises. I, therefore, recommend that a fraud order be issued against the names set forth in the caption of this memorandum."

Correspondence

INJECTION TREATMENT OF VARICOSE VEINS

To the Editor:—In a recent article (THE JOURNAL, Oct. 13, 1928) McPheeters and Rice gave a comprehensive review of complications following the injection treatment of varicose veins, as described in the literature and as occurring in their own series. Such an accumulation of fatalities, necroses, generalized infection and deaths occurring during or shortly after treatment but from independent causes will naturally leave a very unfavorable impression on the mind of the reader. This is hardly the intention of the authors, since a frank description of the pitfalls and complications of such treatment can help to clarify the indications, improve the technic, and institute further precautions.

Our own results have not been accompanied by so many difficulties. At the Varicose Vein Clinic of Northwestern University Medical School, Dr. Quint and I have made more than 1,200 injections on 350 patients. In this series there was not a single case of necrosis and not one case of infection. We have also had no case of embolism, although we cannot control the occurrence of such a complication any more than we can prevent a postoperative embolism. Nevertheless, the ambulant patient, I believe, has a far smaller chance of getting a pulmonary embolus than a patient in bed immobilized.

We believe that the lack of complications in our series may be attributed to the following factors:

1. A careful physical examination of every patient. In this way a coronary thrombosis or a diabetic gangrene will be detected before treatment and may be taken into consideration when advising injections.

2. A thorough test of arterial circulation, before the injection treatment is instituted. Beginning arteriosclerotic and diabetic gangrene, but particularly Buerger's disease, are frequently associated with dilated or even inflamed veins. The developing gangrene may easily be attributed to the injections and not to the natural course of the disease. Injections in such cases are contraindicated.

3. The use of dextrose and invert sugar solutions, instead of sodium chloride or sodium salicylate. It is difficult during a large number of injections to prevent a few drops of the solution from being deposited outside the vein. A 50 per cent dextrose solution, if injected beside the vein, is very painful, but only a small infiltrate results, which is absorbed in a few days. Sodium chloride and sodium salicylate will cause a slough, which if it becomes infected may very easily lead to sepsis, as so many periphlebitic abscesses do.

4. The limitation of injections usually to the veins below the knee. Under no circumstances, however, were injections made above the middle of the thigh. The higher we go in the course of the saphenous vein, the lower becomes the positive pressure and the more the suction action of the deep veins of the pelvis predominates. Without entering into a controversy with McPheeters and Rice, whether a thrombus can form secondarily on top of a primary thrombus, the saphenofemoral junction is certainly not a desirable site for any thrombus.

I wish to emphasize these results, not to create the impression that the injection treatment is an entirely harmless procedure but to point out that cautious indications, thorough examination of the patient, and the use of sugar solutions have given us up to the present time an absence of complications.

GÉZA DE TAKÁTS, M.D., Chicago.

"FRACTURES OF THE METACARPALS AND PHALANGES"

To the Editor:—I was much interested in reading Dr. Magnuson's article "Fractures of the Metacarpals and Phalanges" (THE JOURNAL, November 3). In fractures of the metacarpals and first phalanges, I use a crossbow traction splint adjustably attached to a plaster cast above. Surgeons generally probably use the method advocated by Dr. Magnuson. I have no doubt that with fine mechanical instinct, the method gives good results.

There is one mechanical element in this treatment that he did not stress. Men with less consciousness than he of the value of this detail will fail where he succeeds.

In my judgment, the size, the shape and the placement of the roller in the flexed hand is a matter of great moment. After a phalanx has been reduced, it must be maintained in alinement and extension until healing has sufficiently progressed. The roller bandage of ample size, preferably pounded flat, should extend from a comfortable place in the palm up to and against the distal articulation of the damaged bone. Adhesive plaster is more unyielding than a bandage. The pad should be anchored in the palm with an adhesive strip attached close to or over the knuckles. The finger or fingers, under tension, are drawn around the anterior edge of the roller pad. They are anchored with adhesive tape so as to exercise leverage traction on the distal portion of the broken bone. The anterior rounded edge of the pad acts as the fulcrum. The normal fingers may or may not be included. In the early treatment, they are best included. A roller bandage can cover the hand for cosmetic reasons. Neither bandage nor adhesive tape should be so applied as to draw, or encourage the slip of, the distal articulation toward the proximal articulation of the damaged bone.

A short guttered aluminum splint dorsally applied has supplementary value. Whether many surgeons are equipped to cut and fit such a splint is a question.

HARVEY C. MASLAND, M.D., Philadelphia.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

SODIUM THIOCYANATE IN HYPERTENSION

To the Editor:—I am unable to get any information as to the dosage, how often given and over what period of time, of sodium sulphocyanate in the treatment of hypertension. If you can give me this information I shall greatly appreciate it.

W. E. BORLEY, M.D., Mishawaka, Ind.

ANSWER.—According to J. B. Nichols (The Pharmacologic and Therapeutic Properties of the Sulphocyanates, *Am. J. M. Sc.* **170**:735 [Nov.] 1925) 0.3 Gm. (5 grains) three times a day, after eating, is the usual dose of sodium thiocyanate (sodium sulphocyanate) in hypertension cases. It is well to begin with about 0.15 Gm. (2 grains) and gradually increase it up to the full dose. In discontinuing treatment it is also well to taper off gradually. It may be given in solution with a little peppermint water or other similar aromatic as a vehicle. Its action is similar to that of potassium thiocyanate (Gager, L. T.: The Incidence and Management of Hypertension, THE JOURNAL, Jan. 14, 1928, p. 82). Sodium thiocyanate is not mentioned in the tenth edition of the U. S. Pharmacopeia.

HAIR TONIC FORMULA — COLORING HAIR GROOM

To the Editor:—1. Will you please send to me a hair tonic formula, one containing resorcinol. 2. Could you advise me how to impart a yellow color to a hair groom containing gum tragacanth? M.D., Iowa.

ANSWER.—1. The following is a formula for hair tonic with resorcinol:

	Gm. or Cc.
Corrosive mercuric chloride	0.3
Resorcinol	6.0
Spirit of formic acid	20.0
Alcohol, 50 per cent to make	120.0

Of course, proper precautions must be taken in dispensing so strong a solution of mercuric chloride. Resorcinol, after long use, will sometimes turn the hair dark green. This danger can be avoided by using resorcinol mono-acetate instead, but this is more expensive.

2. The hair groom can be colored yellow with curcuma.

TRAINING LEFT-HANDED CHILDREN

To the Editor:—Please tell me the accepted practice regarding training of a left-handed boy of 6 years. He is starting in school. Should an effort be made to have him abstain from writing with the left hand? Please omit name. M.D., Pennsylvania.

ANSWER.—In the majority of instances it is wiser to train the child to use the left hand. When this is prohibited there may result various disorders in speech and even in general behavior as a consequence of the difficulties entailed in learning to use the right hand. Studies of this subject have recently been carried out particularly at the University of Iowa Psychiatric Institute, Iowa City; reprints of published work can doubtless be secured by writing to the director of that institute.

PRENATAL CARE — CAUSES OF STILLBIRTH — PREMATURE RUPTURE OF PLACENTA

To the Editor:—A white woman, aged 35, apparently in good health, six months pregnant, normal on physical examination, with normal blood pressure, normal urine and a negative Wassermann reaction, had had four children, two of whom were living and well, the other two dying a few hours after birth, and there had been two stillbirths. The stillbirths occurred at full term and were followed by one normal birth, the child living and well; one full term normal birth, the child living four hours, cyanotic and convulsive during life; one full term, forceps delivery, the child now living and well; one full term, normal delivery, the child living eleven hours, intermittently cyanotic and convulsive. In each case the membranes ruptured from one to seven days before birth. In the two instances in which the infants died, the membranes ruptured seven days before delivery. Kindly advise prenatal care for a patient of this kind; also obstetric procedure. Please omit name. M.D., Florida.

ANSWER.—The information given is incomplete. It might be of assistance to know the probable cause of the two stillbirths. The history of six full term pregnancies with four fetal deaths at or within a few hours after labor arouses a strong suspicion of syphilis in spite of the negative Wassermann reaction of the

patient. It is advisable to have a Wassermann test made of the husband, if this has not already been done. A careful history should be taken from both the patient and her husband in an attempt to elicit any signs or symptoms of syphilis. The premature rupture of the membranes may be responsible for the fetal deaths, but this alone probably did not cause the deaths. If intra-uterine infection of the fetuses occurred after the rupture of the membranes, it would almost certainly have been evident when the children were born. The loss of the protection of the fetal head afforded by an intact bag of waters, with consequent prolonged and excessive pressure on the head, may have caused the deaths. In the present pregnancy it would be advisable to induce uterine contractions within twenty-four hours after the bag of waters ruptures if pains do not begin spontaneously during that time.

THE MELTZER-LYON TEST

To the Editor:—Please give me some information concerning the Meltzer-Lyon test used in connection with the differential diagnosis of cholecystitis and other pathologic conditions within the abdomen.

GREENSHAW-HARETER, M.D., Mexico, D. F.

ANSWER.—The method of nonsurgical drainage of the gallbladder as advocated by B. B. Vincent Lyon is based on Meltzer's "law of contrary innervation," which assumes that the gallbladder is supplied by the parasympathetic nervous system while the sphincter of Oddi at the mouth of the common duct is supplied by the sympathetic nervous system. It consists of instilling about 2 ounces of a 25 per cent solution of magnesium sulphate into the duodenum through a duodenal tube. The solution acts on the nerve supply causing relaxation of the sphincter of Oddi and a contraction of the gallbladder, with an expulsion of its contents or else a slow drainage of the entire gallbladder and biliary tract as a result of the relaxation of the sphincter. Drainage occurs if there is no obstruction to the outflow of bile. The definite diagnosis of biliary disease by the examination of bile obtained by this procedure will depend on a knowledge of the amount, character, cytology, bacteriology and cholesterin crystals contained therein normally and pathologically (Scaiefe, B. F.: The Meltzer-Lyon Test in the Diagnosis of Gallbladder Disease, *Ann. Surg.* **78**:604 [Nov.] 1923). Some inflammatory conditions of the gallbladder and biliary tract are responsive to treatment by such drainage; other conditions are not. But before resorting to it as a diagnostic or therapeutic procedure, it may be thoroughly studied in Dr. Lyon's book, entitled "Nonsurgical Drainage of the Gall Tract," published by Lea and Febiger, Philadelphia, 1923.

WASSERMANN REACTION

To the Editor:—In looking over the literature on syphilis and the Wassermann test, I find somewhat varying reports concerning the following questions: 1. How soon after exposure to syphilis may the Wassermann test be taken so that the result can be considered dependable? 2. When should the Wassermann test be made in a case in which the patient has been exposed but has submitted to prophylactic treatment within twenty-four hours thereafter? 3. How long after a patient has completed a course of arsphenamine, bismuth and mercury is it advisable to wait before making the test? 4. If in case 3 the Wassermann reaction is negative, when is it best to repeat it? Please omit my name and address.

M.D., New York.

ANSWER.—1. The Wassermann reaction usually becomes positive in the serum about two weeks after the appearance of the chancre. As this is usually three weeks after exposure, the average date for the appearance of the serum Wassermann test is five weeks after exposure. The literature states, however, that the chancre may be as long as seventy days in making its appearance, and it is not an extremely rare thing for the Wassermann test to remain negative until some time after the appearance of the secondary symptoms. Thus the extreme limit of dependability, so that a negative Wassermann reaction would rule out syphilis, is about six months. The Kahn reaction often appears in the serum more promptly than the Wassermann reaction and should be used in conjunction with it. These tests are to be evaluated as symptoms of the disease alongside the clinical symptoms. To be relied on for diagnosis, the serum tests should be strongly and persistently positive.

2. If the attempted prophylaxis was by the use of ointment of mild mercurous chloride or other local application, the answer to question 1 applies. If some one of the arsphenamines was used for prophylaxis, the possibility of delayed development of the infection must be considered and even more than six months be spent in watching for it.

3. The serum tests may be made at any time. It is usual to make them just before the next course of treatment, with the idea that the treatment may have exerted a little more effect in the rest period.

4. If the reaction is negative, another course of treatment should be given and the Wassermann test repeated. Treatment should not cease, nor should the interval between courses of treatment be lengthened, until many negative reactions have been obtained. The older the case and the longer it has resisted treatment, the longer should it be treated after the serum tests have become persistently negative.

ROUGE DERMATITIS

To the Editor:—I have a daughter who suffers from a rouge dermatitis so severe that a single application produces intense itching, swelling and redness of the parts where applied. She has tried all the rouges on the market without different results from any. She does not suffer ill effect from the use of ordinary white face powders. This has been diagnosed by specialists as seborrhea and as eczema, but the conditions and regularity of its coming and disappearing prove beyond doubt that it is entirely due to the rouge. Is this complaint common among the ladies of today and can you suggest a remedy without her foregoing the rouge?

M.D., Chicago.

ANSWER.—It may be that the girl is sensitized to some substance in the rouge such as alloxan or carmine. Try homemade rouge made of zinc paste (Lassar's paste) colored to her requirement as nearly as possible, with calamine powder or eosin and sulphonated bitumen-N. F. Zinc paste consists of zinc oxide, 25 per cent; starch, 25 per cent, and petrolatum, 50 per cent.

DISPOSAL OF EGG WHITE IN THE BODY

To the Editor:—Will you please inform me what the latest research has shown or proved regarding the disposal of raw egg white in the system, that is, the percentage of acid residue.

S. S. JACQUELIN, M.D., Los Angeles.

ANSWER.—The white of egg contains several proteins, most abundant being egg albumen, which makes up about 90 per cent of the total coagulable protein. The white of egg albumen contains considerable sulphur but little or no phosphorus. When white of egg is incinerated there remains about 0.4 per cent inorganic ash. This is made up principally of equal quantities of sodium, potassium and chlorine, with a trace of calcium, magnesium, and phosphoric acid. Most of the calcium in the whole egg is in the yolk. The question as to the disposition of the acid residue when white of egg is digested and absorbed is therefore essenially a question of disposition of the sulphur. There is apparently not enough alkali base in the white of egg itself to neutralize entirely the sulphur released in the metabolism of egg white into the final products of urea, ammonia and other nitrogenous excretory products. In other words, white of egg is a so-called acid-producing food.

Reliable experiments seem to indicate that on the ingestion of white of egg on top of a diet otherwise adequate in protein, that is, under the conditions of so-called luxus consumption of protein, the sulphur of the egg white is slowly eliminated, requiring several days for elimination of the sulphur from ingestion of a single portion of egg white, under the foregoing conditions. The mechanism by which the body takes care of the excess sulphur in metabolized white of egg is probably not different from that in the case of other sulphur and phosphorus containing proteins; that is, the alkali base is supplied by other ingredients of the food or by the alkali reserve in the blood and tissues. Another complicating factor comes in in the fact that some of the sulphur of the metabolized protein may appear in the urine in the form of so-called conjugated sulphates, which in turn depend apparently on the degree of intestinal putrefaction.

TREATMENT OF CONTRACTURE OF TENDON OF HAND

To the Editor:—I fear a constriction of the third or ring finger of the hand, resulting probably from trauma at some past date. Also, my father suffered from a constricted flexor tendon of the little finger. As the condition is just beginning and is indicated by a palmar dimple, I wish to ask whether it can be arrested by the use of fibrolysin or any other agent other than surgery.

D. H. PETTINGELL, M.D., Midas, Nev.

ANSWER.—The description of the lesion on the hand fits what is known as Dupuytren's contracture. Fibrolysin and other agents have been used, such as x-rays. In the experience of most surgeons, however, they are not satisfactory. The treatment is prolonged and the outcome subject to doubt. The best method of treatment is a complete removal of the palmar fascia which is the involved structure. This should be done by one intimately acquainted with the anatomy and surgery of the hand. The earlier in the course of the disease the operation is performed, the more certain is the permanent cure.

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Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ALABAMA: Montgomery, Jan. 8-11, 1929. Sec., Miss Bessie Tucker, 519 Dexter Ave., Montgomery, Ala.

COLORADO: Denver, Jan. 8, 1929. Sec., Dr. Philip Work, 324 Metropolitan Bldg., Denver, Colo.

DELAWARE: Wilmington, Dec. 11, 1928. Sec., Dr. Harold L. Springer, 1013 Washington St., Wilmington, Del.

DISTRICT OF COLUMBIA: Washington, Jan. 8, 1929. Sec., Dr. Edgar P. Copeland, Suite 110, 1801 Eye St., Washington, D. C.

HAWAII: Honolulu, Jan. 14, 1929. Sec., Dr. James A. Morgan, Room 48, Young Bldg., Honolulu, Hawaii.

ILLINOIS: Chicago, Jan. 22-24, 1929. Supt. of Registration, Dr. V. C. Michels, Springfield, Ill.

LOUISIANA: New Orleans, Dec. 13-15. Sec., Dr. R. B. Harrison, 1507 Hibernia Bank Bldg., New Orleans, La.

MARYLAND: Baltimore, Dec. 11-14, 1928. Sec., Dr. Harry M. Fitzhugh, 1211 Cathedral St., Baltimore, Md.

MINNESOTA—Basic Science: Minneapolis, Jan. 2, 1929. Sec., Dr. E. T. Bell, 110 Anatomy Bldg., University of Minnesota, Minneapolis, Minn.

MINNESOTA: Minneapolis, Jan. 15-17, 1929. Sec., Dr. A. E. Comstock, 524 Lowry Bldg. St. Paul, Minn.

NORTH DAKOTA: Grand Forks, Jan. 1, 1929. Sec., Dr. G. M. Williamson, Grand Forks, N. D.

OREGON: Portland, Jan. 2-4, 1929. Sec., Dr. Joseph F. Wood, 510 Selling Bldg., Portland, Ore.

PENNSYLVANIA: Harrisburg, Jan. 8-12, 1929. Director, Dr. C. D. Koch, Board of Medical Education and Licensure, Harrisburg, Pa.

RHODE ISLAND: Providence, Jan. 3-4, 1929. Sec., Dr. B. U. Richards, State House, Providence, R. I.

SOUTH DAKOTA: Pierre, Jan. 15, 1929. Director, Dr. H. R. Kenaston, Bonesteel, S. D.

WASHINGTON: Basic Science: Olympia, Jan. 10, 1929. Director, Mr. Charles Maybury, Department of Licenses, Olympia, Wash.

WASHINGTON: Olympia, Jan. 14, 1929, Director, Mr. Charles Maybury, Department of Licenses, Olympia, Wash.

WISCONSIN—Basic Science: Milwaukee, Dec. 15, 1928. Sec., Prof. R. N. Bauer, 3410 Wisconsin Ave., Milwaukee, Wis.

WISCONSIN: Madison, Jan. 8-10, 1929. Sec., Dr. Robert E. Flynn, 315 State Bank Bldg., La Crosse, Wis.

Kentucky Reciprocity Report, January to Sept. 1, 1928

Dr. A. T. McCormick, secretary of the Kentucky Board of Medical Examiners, reports 19 physicians licensed through reciprocity and 1 by endorsement of credentials within the period from Jan. 1 to Sept. 1, 1928. The following colleges were represented:

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine		(1926), (1927)	Arkansas
Howard University School of Medicine		(1925)	Dist. Colum.
Rush Medical College		(1927)	Illinois
University of Illinois College of Medicine		(1912)	Illinois
Indiana University School of Medicine		(1927) (2)	Indiana
University of Louisville School of Medicine		(1909) (1927)	W. Virginia
N. Carolina			
Johns Hopkins University School of Medicine		(1920)	Minnesota
University of Maryland School of Medicine and College of Physicians and Surgeons		(1924)	Maryland
Harvard Medical School		(1923)	Illinois
University of Cincinnati College of Medicine		(1927)	Ohio
Western Reserve University School of Medicine		(1920)	Ohio
Woman's Medical College of Pennsylvania		(1926)	Penna.
Lincoln Memorial University Medical Department		(1898)	Virginia
Vanderbilt University School of Medicine		(1927)	Tennessee
Medical College of Virginia		(1915) W. Virginia, (1927)	Virginia

College	ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement from
University of Louisville School of Medicine		(1926)	U. S. Army

West Virginia July Examination

Dr. W. T. Henshaw, secretary of the West Virginia Public Health Council, reports the oral, written and practical examination held at Martinsburg, July 10-12, 1928. The examination covered 11 subjects and included 110 questions. An average of 80 per cent was required to pass. There were 28 candidates and all of them passed. Eleven physicians were licensed through reciprocity with other states. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
George Washington University Medical School		(1927)	89.2
Emory University School of Medicine		(1928) 80.2, 80.5, 84.1,	88.3
University of Louisville School of Med.		(1927) 84.5, (1928)	83.6
Johns Hopkins University School of Medicine		(1923)	88.4
Univ. of Maryland Sch. of Med. and Coll. of P. & S.		(1927)	86.1
Harvard Medical School		(1922) 88.1, (1926)	83.8
St. Louis University School of Medicine		(1927)	87.7
University and Bellevue Hosp. Med. Coll.		(1927) 88.4, (1928)	87.5
Ohio State University College of Medicine		(1928)	85.2
Jefferson Med. Coll. of Philadelphia		(1927) 84.5, 85.4, (1928)	84.7
Medical College of Virginia		(1927) 86.7, (1928) 82.4, 82.7, 83.9, 84, 84.2, 84.8, 87.1, 87.1	80.2,

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Northwestern University Medical School		(1905)	Missouri
University of Louisville School of Med.		(1926) (2), (1927)	Kentucky
University of Michigan Medical School		(1920)	Michigan
Washington University School of Medicine		(1925)	Missouri
Western Reserve University School of Medicine		(1925)	Ohio
Medical College of Virginia		(1927) (3)	Virginia
University of Virginia Department of Medicine		(1920)	Virginia

Colorado July Examination

Dr. Philip Work, secretary of the Colorado Board of Medical Examiners, reports the written examination held at Denver, July 3, 1928. The examination covered 8 subjects and included 80 questions. An average of 75 per cent was required to pass. Of the 48 candidates examined, 45 passed, including 6 osteopaths, and 3 failed, including 2 osteopaths. Fourteen physicians were licensed through reciprocity with other states, and one by endorsement of credentials. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
University of Colorado Sch. of Med.		(1927) 82.1, 84.1, (1928) 81, 81.6, 81.8, 82, 82.4, 82.8, 83.1, 83.6, 83.6, 83.7, 83.8, 84.3, 84.4, 84.8, 85.5, 85.6, 85.7, 85.7, 85.9, 86.4, 86.5, 86.6, 87.1, 87.2, 87.3, 88, 88.6, 89.1, 89.7	79.7,
Rush Medical College		(1927)* 77.0, (1928)†	85.0
Harvard Medical School		(1926)	80.1
Kansas City University of Physicians and Surgeons		(1927)	77.6
Washington University School of Medicine		(1927)	84.7
Creighton University School of Medicine		(1928)	89.9
University of Pennsylvania School of Medicine		(1927)	89.9
Osteopaths		75.1, 77.8, 85.6, 80.3, 88.3,	89.2

College	FAILED	Year Grad.	Per Cent
University of Colorado School of Medicine		(1928)	68.4
Osteopaths			68.2, 72.6

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists		(1926)	California
Emory University School of Medicine		(1917)	Georgia
Chicago Medical School		(1918)	Wyoming
Hahnemann Medical College, Chicago		(1903)	Illinois
Northwestern University Medical School		(1907)	Illinois
University of Illinois College of Medicine		(1926)	Washington
Central College of Physicians and Surgeons		(1904)	Indiana
Atlantic Medical College		(1897)	Dist. Colum.
Johns Hopkins University School of Medicine		(1925)	Maryland
Washington University School of Medicine		(1910)	Illinois
Ohio State University College of Medicine		(1922)	Ohio
Starling-Ohio Medical College		(1912)	Ohio
University of Tennessee College of Medicine		(1927)	Tennessee
University of Toronto Faculty of Medicine		(1923)	Ontario

College	ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement from
Indiana University School of Medicine		(1924)	U. S. Navy

* Not a graduate until December, 1928.
† Not a graduate until 1929.

Connecticut July Homeopathic Reciprocity Report

Dr. Edwin C. M. Hall, secretary of the Connecticut Homeopathic Medical Examining Board, reports three physicians licensed through reciprocity with other states, as of July 10, 1928. The following colleges were represented:

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Hahnemann Medical College and Hospital, Chicago		(1907)	Iowa
New York Homeo. Med. College and Flower Hospital		(1910)	New York
Hahnemann Med. Coll. and Hosp. of Phila., Homeo.		(1904)	Penna.

Alabama July Examination

The Alabama Board of Medical Examiners reports the written examination held at Montgomery, July 10, 1928. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. There were 17 candidates examined and all of them passed. Eighteen physicians were licensed by reciprocity with other states. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
University of Arkansas School of Medicine		(1928)	83.5
Emory University School of Medicine		(1927) (1928) 80.4, 82.7, 84.1, 86.4, 88.6, 90.6	91.2,
Tulane University of Louisiana School of Medicine		(1928)	90.0
Johns Hopkins University School of Medicine		(1928)	90.0
University of Maryland School of Medicine and College of Physicians and Surgeons		(1928)	86.8

Columbia University College of Phys. and Surgs.....(1921)	84.5
University of Pennsylvania School of Med..(1926) 93.2, (1928)	88.4
Medical College of the State of South Carolina.....(1928)	83.9
University of Tennessee College of Medicine.....(1928)	85.6
Vanderbilt University School of Medicine.....(1925)	88.9

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Atlanta Medical College.....(1914)		Georgia
Emory University School of Medicine.....(1923), (1925)		Georgia
Rush Medical College.....(1927)		Illinois
University of Louisville School of Medicine.....(1927)		Kentucky
Tulane Univ. of Louisiana School of Med..(1921), (1927-2)		Louisiana
Johns Hopkins University School of Medicine.....(1924)		Maryland
Western Reserve University School of Medicine.....(1923)		Ohio
Meharry Medical College.....(1918), (1926), (1927		Tennessee
University of Tennessee College of Medicine.....(1925)		Tennessee
Vanderbilt Univ. School of Med....(1922), (1925), (1927-2)		Tennessee

Book Notices

NELSON LOOSE-LEAF LIVING SURGERY. Prepared Under the Direction of an Advisory Board Comprising the Leading Surgeons in the Profession. Editor-In-Chief, Allen O. Whipple, M.D., Professor of Surgery, College of Physicians and Surgeons, Columbia University. Associate editor, Fordyce B. St. John, M.D., Professor of Surgery, College of Physicians and Surgeons, Columbia University. Volumes I, II, III and IV. (To be in eight volumes including index.) Cloth. Price, $87.50 per set. Pp., each volume has separate pagination, with illustrations. New York: Thomas Nelson & Sons, 1927.

The increasing tendency toward specialization in surgery as well as in every other branch of modern medicine has resulted in the evolution of new forms of publication. So detailed is knowledge in many fields that the monograph is required to a greater and greater extent for presenting the present status of knowledge of any single subject. The old system of medicine or surgery consisted of a series of monographs by men who had made notable progress in various fields, these being collected according to various divisions of the body or classifications of disease into large volumes or sections. However, the advancement of medicine and the medical specialties in modern times is so rapid that any permanently bound system is likely to become obsolete within two or three years. This it is that has been responsible for the development of several loose leaf systems of medicine and surgery, which permit the addition of new pages from time to time, and of entire sections when rewriting of such sections may be made necessary. In the preparation of the Nelson Loose-Leaf Living Surgery, eight volumes are contemplated, six of which are already available. The subjects to be listed under gynecology, and the last volume, which is to constitute the index, as well as some chapters of the earlier volumes, have not yet been made available. In the selection of contributors, the editor and his advisory board have shown knowledge of important contributions to modern surgery, and extraordinary discrimination. In almost every case the name of the contributor is recognized at once as that of a writer who has contributed notably to the periodical literature of his subject, who has repute as a clinician and teacher, and whose name will rank in practically every instance among the leaders in that special field.

In volume I a brief history of surgery by Alfred Brown, and sections on physiology and surgery by Joshua E. Sweet, on general anesthesia by James T. Gwathmey, on regional anesthesia by Gaston Labat, and on the legal relations of surgery by William C. Woodward of the Bureau of Legal Medicine of the American Medical Association, are especially significant of the quality of material in this system. The unfortunate lack of good illustrations in the section on the history of surgery should be supplemented, because this material is easily available to Dr. Brown. Indeed, the absence is emphasized by the inclusion as illustrations in the section on bacteriology of photographs of all the ordinary cocci. The section on pathology is notable for a number of well printed and well selected illustrations of pathologic appearances.

Volume II appears to be exceptionally complete. The selection of Francis Carter Wood for the discussion of tumors and of Ashhurst for the consideration of surgical methods, of Archibald for surgery of tuberculosis, of Elsberg for surgery of the spinal cord, of Ivy for surgery of the face and neck, and of Crile for the thyroid gland will seem to every observer exceedingly apropos. An added chapter on irradiation in malignant disease makes immediately necessary new pages for the table of contents. The second volume, like the first, is notable for its numerous illustrations in practically all sections, particularly noteworthy being the lithographed colored plates.

Volume III is devoted largely to orthopedic surgery, fractures and amputations, the sections by Allison, Eliason and Wilson being exceptionally complete, whereas that on the operative treatment of fractures by Dr. William O'Neill Sherman is extraordinarily condensed. This occupies fifty pages, and includes within these fifty pages 118 illustrations.

The fourth and fifth volumes are not yet complete. Sections on surgery of the liver, thorax and breast are still to be provided. Dr. Whipple himself provides the section on the biliary tract, which handsomely illustrates various surgical technics. The section on surgery of the heart by Cutler is a fascinating contribution by a pioneer in this field. Volume VI is devoted to urology. It is handsomely illustrated with halftone, diagrammatic and colored pictures, and compares favorably with any standard textbook on the subject. The contributions of Young and Randall on the prostate present arguments in behalf of both technics. The sections by Hagner, Hinman and Frontz—indeed, all of the sections in this volume—are succinct and authoritative.

The entire system of surgery is printed on excellent paper, with two columns on each page, making reading easy for the eye; the editing has produced a uniformity of presentation and simplicity such as is available in few other systems of surgery. Apparently the successful aim in this system has been to produce a work both modern and reliable.

ERNST BRÜCKE. Von E. Th. Brücke. Boards. Price, 9.60 marks. Pp. 196, with illustrations. Vienna: Julius Springer, 1928.

In the early days of the American pilgrimage to the Viennese medical school the name of Brücke was at least familiar to the visitors, even though few studied in his laboratory. Today few American physicians could associate his name with important contributions to our fundamental knowledge. It is fortunate that his grandson presents a biographic sketch that brings at least an objective survey even if not an exhaustive analysis of his career. Fortune gave Brücke certain advantages. Johannes Müller selected him as a pupil. Du Bois-Reymond and Ludwig became his lifelong friends. The professorship in physiology at Vienna afforded not only an opportunity for work—even though the workshop was inadequate—but cultural associations that made life pleasant. Brücke's interests were diverse. Philology and art vied with physiology, chemistry, histology and anatomy. A study of "The Gold Threads in Mediaeval Brocades" was followed by "The Physiology of Color in the Arts and Crafts" and led to "Experiments with Soluble Berlin Blue as an Injection Fluid." Perhaps it is just this characteristic scattering of interests, this "diversification of crops," that accounts for the fact that Brücke is now remembered by the few. We must accept the probability, however, that his life was made not only the richer but the happier for it. All of his scientific work was characterized by a strict objectivity. In the early forties Du Bois-Reymond wrote: "Brücke and I have resolved to establish the dictum that no other forces exist in the organism than those of a physicochemical character; that when our present observations are inadequate we shall seek to apply purely physicochemical methods or endeavor to establish other related natural forces of a dignity similar to these (i. e., physics and chemistry)." In his dissertation, Brücke had followed this trail by a study of the mechanism of secretion and absorption through living and dead animal membranes. In 1845 he demonstrated that the optic lens and vitreous did not transmit infra-red and ultraviolet rays. In 1846 he studied the reflection of light from the retina—observations that laid the basis for the discovery of the ophthalmoscope by his friend Helmholtz. Here, too, belongs his discovery of the ciliary muscle in the following year. His later work covered a wide range of subjects and his contributions were of fundamental value because of his complete mastery of the technical means of approach to the problems, whether histologic, chemical, physical, mathematical or physiologic. The value of the biography lies, however, less in its strict accounting of Brücke's scientific achievements than in making manifest to the reader the broad aspects of Brücke's life interests. As such it is a distinct contribution to our professional history during its most romantic period.

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HANDBOOK OF PHARMACOGNOSY. By Otto A. Wall, M.D., Ph.G. Revised by Leo Suppan, Ph.G., B.Sc., Professor of Botany and Pharmacognosy in the St. Louis College of Pharmacy. Fifth edition. Cloth. Price, $5. Pp. 472, with 407 illustrations. St. Louis: C. V. Mosby Company, 1928.

The object of the book, as stated in the preface, is mainly to serve as notes on pharmacognosy for students in colleges of pharmacy and as a reference book for retail pharmacists. The book deals with the drugs derived from the vegetable and animal kingdoms with reference to the forms in which they occur in the crude drug trade. The subject matter is presented in a morphologic arrangement under the headings: official Latin and English names; scientific origin; habitat, and description of the drug as it occurs on the market, with special consideration of the histologic characteristics. Chemical constituents and properties of the drugs are listed in a general way. The principal feature of the book is the drawings and illustrations of the material, which enable the student to pick out distinguishing characteristics that serve as an aid to the identification of the drug.

TECHNIQUE OF CONTRACEPTION. The Principles and Practice of Anti-Conceptional Methods. By James F. Cooper, M.D., Medical Director of the Clinical Research Department of the American Birth Control League. Cloth. Price, $7.50. Pp. 271, with 25 illustrations. New York: Day-Nichols, 1928.

The author is medical director of the clinical research department of the American Birth Control League. After a brief introduction to the subject, he describes all the various methods of contraception, analyzing them scientifically as to their virtues and fallacies. Much tabular data, accumulated in the study of a thousand cases in the New York clinic, are presented, this material being of sociological as well as medical interest. The book provides a complete description of American clinics in this field, literature on other countries, and a study of the law. It is a useful book for any one interested in this phase of medical discussion. It is not, however, to be had in book stores, and because of the difficulties associated with distribution is sold at a price somewhat beyond the cost of books with the same number of pages and illustrations.

HANDBUCH DER MIKROSKOPISCHEN ANATOMIE DES MENSCHEN. Herausgegeben von Wilhelm v. Möllendorff. Band II. Die Gewebe. Teil 1. Epithel- und Drüsengewebe. Bindegewebe, Blutbildende Gewebe und Blut. Von J. Brodersen, A. Maximow, und J. Schaffer. Paper. Price, 135 marks. Pp. 703, with 306 illustrations. Berlin: Julius Springer, 1927.

This is one of the most important volumes of the new comprehensive treatise on histology. It deals with epithelium, connective tissues, hematopoietic organs and blood. Schaffer's scholarly chapter describes in detail all kinds of epithelial cells, cilia and similar formations, cuticulae, the passage of wandercells through epithelium, and its regenerative capacities. There are instructive details from lower vertebrates and invertebrates which illuminate mammalian conditions. A third of the chapter is devoted to the classification and description of glands and glandular activities. The author's familiarity with the older literature adds much of historical interest; his wide experience and critical judgment make this an important contribution. There are errors and omissions in the discussions of mitochondria, Golgi apparatus and other cytologic structures that have recently come into prominence. Maximow's monograph on the derivatives of the mesenchyme is a masterpiece; the modern ideal of a physiologic histology reaches full expression. Cells are classified on the basis of internal anatomy, behavior under various conditions, potencies, relationships and functions. The histology and histogenesis of the various connective tissues, of serous membranes, of the leptomeninx, lymphoid organs, bone marrow and the spleen are taken up. There are many new observations and beautiful drawings from the author's own hand. While the bulk of the space is devoted to mammalian tissues, all classes of vertebrates are considered and the general conclusions have an exceptionally broad factual basis. Full justice has been done not only to the German but also to the English, French, Italian and Russian literature. In the presence of such critical acumen one is taken aback in a few instances, as by the favorable reception given the hypothesis that fibrin may be directly transformed into collagen; surely the author has not considered the revolutionary chemical transformations that are postulated in the absence of cellular activity. The chapter ends with a convincing presentation of the monophyletic theory of the blood cells. From the evidence set forth there are some who will question the conclusion that endothelial cells and fibroblasts have very limited potencies. Brodersen's chapter is confined largely to the formed elements of the human blood. Each cell type is described as to its appearance in the fresh condition under normal and experimental conditions, and as to cytologic and nuclear characters, movements and functions. The last category includes the literature on vertebrates in general and is particularly helpful.

Books Received

Books received are acknowledged in this column, and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender. Selections will be made for more extensive review in the interests of our readers and as space permits. Books listed in this department are not available for lending. Any information concerning them will be supplied on request.

LES RAYONS ULTRAVIOLETS. Par E. et H. Biancani. Actinothérapie IV. Paper. Pp. 217, with 10 illustrations. Paris: Gauthier-Villars & Cie, 1928.

Poorly developed French monograph on the ultraviolet rays.

HANDBUCH DER PATHOGENEN MIKROORGANISMEN. Herausgegeben von W. Kolle, R. Kraus, und P. Uhlenhuth. Lieferung 24. Band III. Chemotherapie der Infektionskrankheiten. Von Prof. Dr. H. Schlossberger. Allgemeine Epidemiologie. Von Prof. Dr. K. Kisskalt. Allgemeine Prophylaxe der Infektionskrankheiten. Von Prof. Dr. E. Gotschlich. Third edition. Paper. Price, 22 marks. Pp. 549-828. Jena: Gustav Fischer, 1928.

L'ORGANISATION DE LA LUTTE ANTIVÉNÉRIENNE DANS LE CADRE DÉPARTEMENTAL: Sa réalisation en Meurthe-et-Moselle. Par Louis Spillmann, doyen de la Faculté de médecine de Nancy, et Jacques Parisot, professeur d'hygiène et de médecine préventive à la Faculté de médecine de Nancy. Paper. Price, 10 francs. Pp. 60, with 30 illustrations. Nancy: Berger-Levrault, 1928.

GROWTH AND DEVELOPMENT WITH SPECIAL REFERENCE TO DOMESTIC ANIMALS. XII: Additional Illustrations of the Influence of Food Supply on the Velocity Constant of Growth and on the Shape of the Growth Curve. University of Missouri College of Agriculture. Agricultural Experiment Station Research Bulletin 116. Paper. Pp. 16, with 11 illustrations. Columbia, Mo., 1928.

GROWTH AND DEVELOPMENT WITH SPECIAL REFERENCE TO DOMESTIC ANIMALS. XI: Further Investigations on Surface Area with Special Reference to Its Significance in Energy Metabolism. University of Missouri College of Agriculture. Agricultural Experiment Station Research Bulletin 115. Paper. Pp. 60, with illustrations. Columbia, Mo., 1928.

L'ORGANISATION DE LA LUTTE ANTITUBERCULEUSE DANS LE CADRE DÉPARTEMENTAL: Sa réalisation en Meurthe-et-Moselle. Par Dr. Jacques Parisot, professeur d'hygiène et de médecine préventive à la Faculté de médecine de Nancy. Paper. Price, 15 francs. Pp. 98, with 68 illustrations. Nancy: Berger-Levrault, 1928.

CENTENAIRE DE LA FACULTÉ DE MÉDECINE DU CAIRE ET CONGRÈS INTERNATIONAL DE MÉDECINE TROPICALE ET D'HYGIENE. Sous le haut patronage de sa majesté le Roi Fouad I. Caire (Egypte) du 15 au 22 Décembre 1928. Paper. Pp. 178. Cairo, 1928.

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ADMINISTRATION REPORT OF THE DIRECTOR OF MEDICAL AND SANITARY SERVICES OF CEYLON FOR 1927. Part IV: Education, Science, and Art (C). Paper. Price, Rs. 3.25. Colombo, Ceylon: Government Record Office, 1928.

YEAR BOOK OF THE ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, SESSION 1928-29. Paper. Price, 5s. net. Pp. 108. London: Royal Society of Tropical Medicine and Hygiene, 1928.

METHODS AND PROBLEMS OF MEDICAL EDUCATION. (Tenth Series.) Paper. Gratis. Pp. 343, with illustrations. New York: Rockefeller Foundation, 1928.

Medicolegal

When Insane Delusions Invalidate a Will

(Rodgers et al. v. Fleming et al. (Texas), 3 S. W. (2d) 77)

The will of the testator, W. J. McDonald, in the county court was ordered to be probated, and likewise on appeal in the district court. The judgment of the district court was affirmed by the court of civil appeals for the Sixth District, and the contestants thereupon carried the case by writ of error to the commission on appeals of Texas, section B. The case was submitted on a single special issue, as follows: "Did or did not W. J. McDonald have testamentary capacity on May 8, 1925, at the time he executed the will in controversy?" Accompanying the issue was an instruction defining "testamentary capacity," as follows:

To make a valid will, the person making the will must have testamentary capacity at the time of the execution of the will. By testamentary capacity is meant that the person at the time of the execution of the will has sufficient mental ability to understand the business in which he is engaged, the effect of his act in making the will, and the general nature and extent of his property. He must also be able to know his next of kin and the natural objects of his bounty. He must have memory sufficient to collect in his mind the elements of the business to be transacted and to hold them long enough to perceive at least their obvious relation to each other, and to be able to form a reasonable judgment as to them.

The contestants requested the following special charge:

If at the time of the execution of the will by W. J. McDonald on May 8, 1925, he was under the influence of an insane delusion or delusions affecting the disposition of his property which he was making, then you are instructed that he did not at said time have testamentary capacity. An insane delusion is the belief of the existence of a state of supposed facts which no rational person would have believed.

The trial court refused to give the charge requested, and the case turned on the correctness of the court's refusal. It was contended on behalf of the proponents of the will that the instruction was properly refused, because the proponents had not in their pleadings specially raised the question of insane delusions. The commission on appeals pointed out that the matter had been definitely settled otherwise in Texas. Insane delusions are not within themselves a ground of attack against the probating of a will, except as they show a want of testamentary capacity. The real defense is want of testamentary capacity, whether produced by ordinary and complete insanity or by temporary aberrations or insane delusions. Where want of capacity is pleaded, though general in the form of its expression, it may nevertheless be proved in any way recognized by the law of evidence. Under such general allegations, proof of temporary insanity or of insane delusions affecting the execution of the instrument in its material respects would be admissible. There is much to be said for the holding that it is not necessary in any case to plead specifically that the want of testamentary capacity proceeded from insane delusions. Of course, a case might arise in which, on special exceptions being urged to the generality of the plea, incapacity would have to be pleaded. Nothing of that kind was before the commission in this case. The evidence raised the issue of insane delusions and made necessary the giving of the requested instruction. The trial court and the court of civil appeals erred in holding to the contrary. Judgments of the courts below were reversed and the cause remanded to the district court.

Pallor Contrasted with Hemoglobin Test

(Capital Traction Co. v. Lyon (D. C.), 24 F. (2d) 262)

This is an appeal from a judgment rendered in the trial court in favor of the appellee for $5,000 damages for personal injuries sustained through the negligent operation of the appellant's street car. Dr. Sexton testified for the appellee that he gave medical attention to a wound on the appellee's arm, which had been sutured by surgeons; that in the hospital he found the appellee in a semicomatose, pale, exsanguinated condition, with a faint, weak and somewhat rapid pulse; that he was the appellee's family physician and that prior to the injury the appellee was of a ruddy color and in excellent health. On being asked whether the appellee's color had come back to normal, Dr. Sexton replied that it was pretty difficult to tell from his color, but from the test of the hemoglobin of the blood it was only mildly deficient—hemoglobin of about 80, when 90 is about normal. Counsel for the appellant moved that Dr. Sexton's statement be stricken from the records unless there was some testimony to show that he had tested the appellee's blood prior to the accident. In affirming the judgment of the court below, the court of appeals said:

The court did not err in refusing to strike out the testimony of Dr. Sexton as to the result of a hemoglobin test made by him of plaintiff's blood after the plaintiff was taken to the emergency hospital. Hemoglobin is the solid coloring matter of the red corpuscles of the blood, and testimony as to their count might well be regarded as immaterial, if no evidence had been introduced showing or tending to show the condition of the plaintiff's blood prior to the accident. Dr. Sexton, however, before testifying as to hemoglobin count, had testified that plaintiff's color before receiving the wound in his arm was ruddy, that after the accident he was pale, and that during the healing of the wound his color gradually returned. The doctor's testimony concerning the hemoglobin count was in some degree corroborative of his statement that the plaintiff was pale after the accident, and was, therefore, admissible.

Right of Osteopath to Administer Drugs

(State Board of Medical Examiners v. Baudendistel (N. J.), 140 A. 886)

The defendant, Baudendistel, was convicted in the first district court of New Jersey on a complaint charging him with a violation of the state medical practice act. He appealed to the supreme court of New Jersey. The evidence in the case established the facts that the defendant held licenses to practice osteopathy and chiropractic; that he displayed a sign in his office window which read: "Dr. Chas. Baudendistel"; that on numerous occasions he had treated persons who came to him for medical treatment by giving them medicines to effect a cure for the ailments of which they complained. The defendant contended that the practice of osteopathy was expressly excluded from the application of the prohibitory provisions of the medical practice act and that, since he had a license to practice osteopathy, the acts complained of did not constitute a violation of the medical practice act. The supreme court, however, in affirming the judgment of the district court, held that the practice of osteopathy was confined to the manipulation of the human body by applying the hands only to the body of the patient, citing *State* v. *Herring*, 70 N. J. Law 34, 56 A. 670, 1 Ann. Cas. 51.

Contract Not to Practice Valid

(Proctor v. Hansel (Iowa), 218 N. W. 255)

The appellee, Hansel, had practiced osteopathy in Ames, Iowa, since 1899. Dec. 31, 1925, he entered into a written agreement with the appellant, Proctor, whereby the appellee was to furnish suitable quarters and equipment for the practice of osteopathy and the appellant was to pay to the appellee 30 per cent of all fees derived from the practice of osteopathy under the agreement. The agreement was to continue in force for one year. It provided that the appellant should not compete with the appellee nor engage in the practice of osteopathy in Ames, in opposition to the appellee, for three years from and after the termination of the agreement, without the written consent of the appellee. When the period of the agreement expired, the appellee notified the appellant that their relations were at an end. The appellant thereupon opened an office for himself in Ames and continued to practice until an injunction was issued, on the petition of the appellee, requiring him to desist. From that injunction the appellant appealed to the supreme court of Iowa. He contended that the written contract did not express the true agreement of the parties and pleaded that he had signed it without knowing its contents. The court found, however, no evidence of fraud, deception, concealment or overreaching in the signing of the contract; the defendant had ample time to read it before he signed it, and no false statements were made as to its contents; there was no showing on which the court could find that the contract was not fairly entered into or that all of its terms were not binding on the parties. The appellant contended further that the contract itself was against public policy and should not be upheld and enforced. But the court could find nothing of that sort, nor

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anything to render it so oppressive, unreasonable or unconscionable as to make it unenforceable. Contracts of this general character are often made where the seller agrees not to reengage in competition with the buyer, within a limited area and for a limited time, which the courts generally hold valid. To the appellant's argument that the appellee was not entitled to relief by injunction, but to only such relief as he might obtain through suit for damages for breach of the contract, the court held that injunctive relief was proper. To permit the appellant to leave the appellee's offices and to establish a competing office in the same town in direct derogation of the contract, and to require the complaint to prove in a court of law the specific damages he might suffer by loss of patients who sought the appellant's services in preference to those of the appellee, would be to place a serious limitation on the powers of a court of chancery. The decree of the trial court was correct and was therefore affirmed.

Termination of Suit at Request of Party Whose Mental Competence Is in Question

(Warker v. Warker et al. (N. J.), 140 A. 889)

The complainant, an aged, feeble and infirm woman, brought this suit in the court of chancery of New Jersey to set aside a conveyance of property that she had voluntarily executed to the defendants without independent advice. In connection with this suit, the complainant made the unusual application to the court that a receiver be appointed to manage her property, alleging that her memory had been affected, especially since a recent illness, to such an extent as to make it difficult for her to recall events that had transpired even in the very recent past. She did not, however, pretend to be *non compos mentis*.

Before the case came to trial, the complainant's counsel represented to the court that the defendants had reinstated themselves in the good graces of the complainant and that he had been notified by the complainant that she no longer wished him to represent her and that she desired that her suit be dismissed on her motion and the consent of both the defendants. The court, however, refused to consent to the dismissal of the suit, holding that while ordinary litigants may agree to a termination of a pending suit in which the public interest is not affected, a different rule applies when one of the litigants is under a disability sufficient to put him at such a disadvantage in dealing with his own affairs as to make him utterly incapable of protecting himself and his property. Such a litigant, the court said, becomes a ward of the court acting in its capacity as agent of the state. The court drew an analogy between the instant case and the case of *In re Rhodes*, 136 A. 408, in which a petitioner in a lunacy inquisition directed her counsel, after the proceeding had been instituted, to dismiss it, the court holding that public interest was involved and refusing to dismiss the proceedings.

"Death from External Violence" Construed

(Druhl et al. v. Equitable Life Assur. Soc. (N. D.), 218 N. W. 220)

The plaintiffs sued as beneficiaries under a policy that provided for double indemnity in case of death from accident. The insured received a severe, accidental blow on his abdomen. Not long after the accident, an operation was performed for appendicitis. It disclosed that he was not suffering from that disease. While he was under the anesthetic, an exploratory operation was performed, the exact nature of which does not appear from the evidence. The insured died about nine days later. An autopsy revealed in the abdominal cavity a blood clot about 3 inches in diameter and a complete intestinal obstruction. Autopsy showed, too, that the insured, a number of years prior to the autopsy, had been operated on for hernia. The physician who performed the autopsy and those who saw it testified that the obstruction of the bowel was due to the twisting of the small bowel around a band of adhesions, which were described as old adhesions. In the opinion of the physician who performed the autopsy, the blood clot found in the abdomen was caused by the blow, the obstruction of the bowels was occasioned by the same blow, and the poisoning of the system of the insured that resulted in his death was due to the obstruction of the bowels; the blow was the immediate cause of death. Judgment was rendered for the beneficiaries under the policy, the plaintiffs in the case, and the insurer appealed. The insurer contended that death did not result solely from bodily injuries caused directly, exclusively and independently of all other causes by external, violent and purely accidental means, but that it was caused directly or indirectly by disease or physical infirmity. The supreme court of North Dakota pointed out, however, that although the blow itself did not result in death it resulted in the obstruction of the bowels, and that in turn caused the poisoning of the insured's system and his death. The court added:

> In order to render the injury one caused by external and violent means, it is not necessary that the external means should itself cause death; it is only necessary that the cause of death shall be external to the person although it acts internally. And when an accident causes a diseased condition which, together with the accident, results in injury or death, the accident alone is to be considered the cause of the injury or death.

The insurer further contended that the death of the insured was the result of disease or physical infirmity, not of bodily injuries; that is, that the adhesions were a cause contributing directly to the death. The insurance policy was prepared by the insurance company, and where a policy provision emanating from a company is susceptible of two meanings, the one most favorable to the insured will be adopted. To the court it did not seem reasonable to believe that when the parties to the insurance contract spoke of "physical infirmity" they had in mind any slight derangement, malformation or susceptibility to disease, of which the insured was ignorant, which even the medical examiner of the insurance company apparently did not discover, and which probably no other physician could have discovered. It seems reasonable to believe that by the term "physical infirmity" the parties had in mind settled disease, ailments, or derangements of such nature and character as had a direct tendency to weaken and undermine the constitution of the insured, reduce his powers of resistance, and thereby enhance the risk of death in case of injury. The judgment appealed from was affirmed.

Death from Disease Aggravated by Treatment of Injury Compensable

(Smith v. Mason Bros Co., et al. (Minn.), 218 N. W. 243)

The husband of the plaintiff, while driving a truck in the course of his employment, received a blow on the abdomen, by coming into contact with the steering wheel. Within a few days a physician diagnosed the case as acute appendicitis but would not operate because of the condition of the heart and kidneys. A few days later, however, his own physician made a like diagnosis, and operated eleven days after the injury. He found a gangrenous mass, a portion of the omentum, which had become twisted until the circulation had been cut off. This condition, it was testified, could not have existed prior to the accident. The gangrenous mass and the appendix were removed. The appendix was small and somewhat kinked, but it had nothing to do with the torsion of the omentum. The operation was begun under local anesthesia, but while it was being performed it became necessary to give a general anesthetic. The patient was doing well until the seventh day, when the wound broke open because of a fit of coughing. It was closed and a fairly good convalescence followed. Four months after the accident, he died. The attending physician and the operating surgeon testified that the blow on the abdomen caused the condition which necessitated the operation, and that the general anesthetic necessarily used in the operation aggravated the disease conditions of the heart and kidneys of the deceased and hastened his death. The industrial commission awarded compensation to the widow, and the insurer, by certiorari, appealed to the supreme court of Minnesota. Citing previous decisions of its own, the court pointed out that an aggravation of an existing infirmity, caused by an accident occurring in the course of employment, is compensable, and that the findings of the industrial commission must prevail unless they are clearly and manifestly contrary to the evidence. The commission is a trier of facts, and, where there is a choice between conflicting evidence or diverse inferences may be drawn from the evidence, its conclusions should stand. The order of the industrial commission awarding compensation to the widow was affirmed.

Society Proceedings

COMING MEETINGS

District of Columbia, Medical Society of, Washington, January 2. Dr. C. B. Conklin, 1718 M Street, N. W., Washington, Secretary.
Philippine Islands Medical Association, Manila, December 12-15. Dr. A. S. Fernando, 547 Calle Herran, Manila, Secretary.
Society of American Bacteriologists, Richmond, Va., December 27-29. Dr. James M. Sherman, Cornell University, Ithaca, N. Y., Secretary.
Southern Surgical Association, White Sulphur Springs, W. Va., December 11-13. Dr. R. L. Payne, Medical Arts Bldg., Norfolk, Va., Secy.
Western Surgical Association, Chicago, December 14-15. Dr. Harry P. Ritchie, 914 Lowry Building, St. Paul, Secretary.

CHICAGO PEDIATRIC SOCIETY

Meeting held at Cook County Hospital, Oct. 16, 1928

The President, DR. MAURICE L. BLATT, in the Chair

Food Irradiation

HARRY STEENBOCK, PH.D., Madison, Wis.: The general proposition of food irradiation was brought to my attention by some experiments carried out with a goat in a study of its calcium balance under various dietary conditions. These experiments were carried out in 1913, but owing to the extensive program of experimentation in progress the observations made at that time were not put to a more crucial test until 1923. In 1923, during work on growth carried out at the Lister Institute, experiments were made in which the diets of rats that had ceased to grow were exposed to ultraviolet rays. It was found that such diets, or even tissues of the animals, irradiated, had imparted to them the property not only of inducing growth and maintaining it but also of bringing about an increase in the ash content of the skeleton with concomitant healing of rachitic lesions. These experiments were elaborated on with the result that practically all food substances outside of cane sugar, salts and water were found susceptible of being activated by such irradiation treatment. Later it was found that the activity could be induced not in oils and fats but in the unsaponifiable constituents contained therein, and specifically in the sterol fraction. Later, Hess and Windaus, and Rosenheim and Webster, found that not all sterols, but apparently only ergosterol, when irradiated, represents the potent agent.

Thus means are now available to prevent rickets and to cure rickets and analogous conditions of deficient calcification of the skeleton by dietary treatment. The work has furnished the possible explanation for the activity resident in cod liver oil. However, it has recently developed that ergosterol administered in excessive doses, approximately in the neighborhood of 1,000 times the therapeutic dose, is capable of exerting a toxic action. This has necessitated that the treatment of foods and medicinals be carefully controlled in order that harmful effects may be prevented.

It is this problem which the Wisconsin Alumni Research Foundation has set for itself, because this organization is in possession of patents covering the irradiation process. At present it is considered possible that, by the judicious use of foods and medicinals treated with ultraviolet rays, the public may derive the benefit of this discovery without any hazards.

DISCUSSION

DR. JULIUS H. HESS, Chicago: The impression that I now carry with me is that the Wisconsin Research Foundation has already done so or is prepared to grant licenses to several firms to use the patented process controlled by it for the purpose of irradiating food and medicinal products. Believing that there are real dangers of overdosage, I am taking the liberty of quoting from literature issued by two of the firms prepared to enter the market at this time with products containing irradiated ergosterol. In the following discussion of the two products they will be spoken of as product A and product B. In the literature distributed descriptive of product A, the following statement appears: "Each minim of ——— is equivalent in vitamin D potency to 1½ drams of cod liver oil. The suggested dose for infants is 1 to 5 drops daily." On the carton enclosing the product as it is to be marketed there appears the statement "1 drop equals in vitamin D potency 1½ teaspoonfuls of cod liver oil." I wish to direct attention to the fact that when this product is dropped from the dropper furnished with the bottle, the drop averages but little more than one-half minim. In the booklet describing product B, the dose recommended for infants and young children is "5 to 10 drops." On the carton enclosing product A, the statement is made that it is standardized to 100 times the antirachitic potency of high grade cod liver oil, while product B is standardized to approximately 200 times the antirachitic potency of standardized cod liver oil. If these figures permit of comparison, the amount of irradiated ergosterol stated as being contained in product A is much less than that contained in product B and yet the dose recommended is only about one-half as much. These recommendations are most confusing and leave the impression of a marked uncertainty as to the dosage. In fact, samples of product A and B recently tested show approximately sixteen times the activity in B as compared with A.

The methods of standardization of the two products again add to the confusion surrounding the administration of the products, one being standardized on the basis of a definite number of milligrams of irradiated ergosterol per dose whereas the manufacturer of the other product states that, as a result of the great variation in the character of the ergosterol itself as concerns its capacity to assume antirachitic activity, such a standardization is impracticable and that each batch must be individually tested by animal experimentation.

A personal communication from one of the producers states: "We should say that irradiated ergosterol must be considered as an extremely potent drug such as tincture of digitalis—that small doses are very beneficial and large doses are toxic." They further say that it is their belief that irradiated ergosterol should be prescribed only by physicians and not under any circumstances be placed at the disposal of the general public. Such control of the product appears to be impossible if marketed as planned at present.

The published literature contains numerous references to the varying effects following the doses recommended by manufacturers in normal infants fed prophylactically and similar amounts fed to rachitic infants. This applies more especially to the not infrequent development of the symptoms of hypercalcemia in normal infants. Clinical reports indicate that this is by far less common in rachitic infants. These are worthy of serious consideration. The literature also contains references to the cumulative action of irradiated ergosterol as evidenced by the constancy of high calcium and high phosphorus in the blood.

In view of the difficulties of standardizing the dosage and estimating the therapeutic effect on normal infants prophylactically fed and rachitic infants therapeutically treated with irradiated ergosterol, does it seem reasonably safe and sound to flood the market with more complex irradiated food products such as whole canned milk, dried milk, cereals and yeast? I ask this question advisedly after being told by the head of the experimental medicine department of one of the firms promised a license to irradiate ergosterol by the foundation that his firm believed that at least six to twelve months more would be needed by them to evaluate their product properly.

Of even greater interest may be the announcement this afternoon of the producers of product A that they are to recall all commercial shipments already made of their irradiated ergosterol and that they will withhold it from the market until the prophylactic and therapeutic indications and the dosage are established by further clinical research.

F. C. KOCH, PH.D., Chicago: I think it is safe to say that if the irradiation of foods, or even of supposedly pure substances as ergot or cholesterol, or modified cholesterol as some of us think, is permitted to be practiced without full control, we are certain to obtain substances that will vary in potency in rickets, and also possibly add toxic substances as a side issure. There is danger of that and I do not think we should take a chance until we have investigated all of the phases very carefully. It is much better to try to prevent these errors than to do the harm and try to correct these errors later. One question is the purity of ergosterol itself. The recent literature on the subject points to the fact that probably at present no really pure ergosterol is being used. English workers have found zymosterol present in ergosterol, and others claim to have found still other sterols. This shows the many details that will have to be followed up before this material can be used intelligently.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Diseases of Children, Chicago

36: 875-1092 (Nov.) 1928

*Healing in Infantile Scurvy as Shown by Roentgen Ray. S. McLean, New York, and R. McIntosh, Baltimore.—p. 875.
*Preventorium Child. I. D. Bronfin, Denver.—p. 931.
*Comparison of Cod Liver Oil and Ultraviolet Ray for Use in Prevention of Rickets. A. D. Holmes and Others, Boston.—p. 952.
*Prenatal Factor in Susceptibility of Infants to Rickets. A. F. Hess and M. Weinstock, New York.—p. 966.
*Stimulation of Growth of School Children by Small Supplementary Feedings. A. F. Morgan and L. Warren, Berkeley, Calif.—p. 972.
*Metabolism of Undernourished Children: VI. Caloric Balance. C. C. Wang, M. Frank and M. Kaucher, Chicago.—p. 979.
*Clinical Study of Enuresis. A. Bleyer, St. Louis.—p. 989.
*Sickle Cell Anemia. M. Wollstein and K. V. Kreidel, New York.—p. 998.
*Allergy in Infant of Three Weeks. G. M. Lyon, Huntington, W. Va.—p. 1012.
Intussusception of Ileum Due to Papilloma in Child of Twenty-One Months. E. J. Lamb, Santa Barbara, Calif.—p. 1017.
Sinusitis in Children. S. L. Ruskin, New York.—p. 1020.
Felix Platter, 1536-1614. J. Ruhräh, Baltimore.—p. 1037.

Healing in Infantile Scurvy.—The types of disturbances which may be found in roentgenograms of the long bones of infants with scurvy are enumerated by McLean and McIntosh, and their modulations during the process of healing are described. A series of 115 roentgenologic examinations in fifty-two patients with scurvy is analyzed, with particular reference to the variation in the picture according to the stage of the disease. The relative value of the roentgen signs of scurvy from the point of view of diagnosis in acute cases and the relative frequency of the various signs presented for all stages of the healing process for their series are discussed. The period covered by this analysis ranges from the first day of active antiscorbutic treatment to twelve years later. The series is briefly analyzed from the point of view of symptomatology and physical manifestations.

Preventorium Child: Juvenile Tuberculosis.—Bronfin asserts that active juvenile tuberculosis is still unrecognized in the majority of instances, and physical signs of juvenile tuberculosis are indefinite and often misleading. The history and symptoms are more important as a basis for treatment than the physical signs. The roentgen ray is of the greatest aid in diagnosis. Bronfin feels that the practical solution of the problem of tuberculosis in adults depends in a large measure on the attention that is accorded children with latent or active tuberculosis. All patients who have been exposed to the disease should have a limited period of residence in a suitable hospital or should be under continued close medical supervision, even in the absence of symptoms. Bronfin is convinced that preventoriums for the observation of children who have been exposed and the treatment for juvenile tuberculosis are needed as urgently as sanatoriums for the treatment of adults with tuberculosis.

Cod Liver Oil and Ultraviolet Rays in Prevention of Rickets.—Comparison is made by Holmes et al. of the mineral metabolism of seven groups of rats and controls, treated by direct irradiation and direct irradiation plus 14.8, 4.9, 14.8, 19.8 and 29.7 mg. of cod liver oil, respectively, which were maintained for thirty-six days, after weaning, on a rachitic-producing diet and on the same diet supplemented with ultraviolet irradiation or cod liver oil. As judged by the growth, by roentgenograms of the femur and tibia, by the calcium and phosphorus content of the blood serum and by the mineral content of the femur and tibia, the mineral metabolism of the controls was decidedly inferior to that of the animals receiving the rachitic diet supplemented with ultraviolet irradiation or cod liver oil. Aside from the control group, an average increase in body weight during the thirty-six day experimental period was greatest for the group fed 19.8 mg. of cod liver oil and least for the group receiving direct irradiation and the group fed 14.8 mg. of cod liver oil. The calcium content of the blood serum of the groups other than the controls is in rather close agreement. The phosphorus content of the blood serum for the group receiving direct irradiation is definitely higher than that of the controls, but materially lower than that of the other five groups. In general, the results reported show that 5 mg. of the cod liver oil under consideration has sufficient antirachitic activity to protect laboratory animals against rickets when maintained under the conditions described. The results also indicate that 5 mg. of the oil under consideration gives greater protection than fifteen minutes of irradiation with ultraviolet rays at a distance of 36 inches, and that 5 mg. of this cod liver oil appears to be as effective as larger amounts when used as a protection against rickets.

Prenatal Factor in Susceptibility to Rickets.—It has been taken for granted that variation in predisposition to rickets is due largely to variability in the store of the antirachitic factor which infants bring with them into the world, the store being magazined in the liver. In order to subject this hypothesis to the test of experiment, Hess and Weinstock carried out a biologic assay of the livers of a series of infants. As it is well established that premature infants have the greatest predisposition to rickets—in fact, few of them are spared even when nursed and given cod liver oil early in life—one would expect a definite lack of the antirachitic factor in the group as compared with infants born at full term. This study showed, on the contrary, that the livers of premature infants contain as much of the antirachitic factor as those of infants born at term. In view of this result, it would seem that, in general, individual predisposition to this disorder does not depend on prenatal hoarding of this "vitamin," but on other factors.

Stimulation of Growth by Supplementary Feedings.—Morgan and Warren selected 177 children in attendance at a public school in Oakland, Calif., for measurement and supplementary feeding. The economic status of the families from which these children came was relatively low. About one half of the children were 7 per cent or more underweight for height. Four groups were formed, one of which did not receive extra food and the others of which received half a pint of milk, one orange and a small cracker sandwich, respectively, each school day for ten weeks. Changes in weight and standing height were observed at the end of the period. The children in all three groups given suplementary feedings made large gains in growth as compared with the controls. The groups fed on milk and crackers gained weight at about the same rate, and the group fed on oranges somewhat less. The group fed on oranges, however, made better gains in height than the others. The girls in all groups and at all ages gained more in both weight and height than the boys. The mere addition of extra calories furnished a measurable advantage for these children. These results are compared with those found in former studies, and the inference is drawn that the choice of a supplementary lunch for a given group of children should be made only after careful consideration of home conditions and preferably after such preliminary observation as is here described.

Metabolism of Undernourished Children.—In the study made by Wang et al. of ten normal and twenty-six undernourished children, no differences were found in the power to absorb food material or in the caloric utilization of the two groups. The percentage absorption was the same in all groups, regardless of the degree of underweight or of the actual caloric intake. The actual utilization varies directly with the caloric intake, the ratio between the two being a constant with a numerical value of 1.09. The loss of heat in the feces was found to vary in proportion to the intake, the percentage utilization remaining the same in all cases, independent of the weight of the feces or the fecal heat loss.

Study of Enuresis.—A group of 252 children with enuresis was studied by Bleyer over a period of three years. Clinical analysis of certain factors commonly held accountable for enuresis failed to show their relation to this disease. Cures in this series of cases amounted to about 80 per cent and were accomplished without regard for any of these factors by mea-

sures directed to the bladder itself. A study of the incidence of enuresis in relation to sex suggests that the cause of this disease does not reside in any anatomic or physiologic peculiarity external to the orifice of the bladder. The rôle of the voluntary nervous system is unimportant in enuresis. This disease is, in effect, a disturbance of the physiology of micturition, probably due to stimuli arising in the bladder itself which for the time being place it beyond the control of the will. Discipline plays no part in true enuresis, since this disease does not owe its origin to a lack of discipline nor is it controlled by this measure. In conformity with the definition of enuresis evolved in this study, the term enuresis vera is suggested to indicate that type in which dissociation between the brain and the voluntary nervous system, as concerns the physiology of micturition, actually appears to exist, and the term pseudo-enuresis is reserved for that type of defective control which can be relieved by measures designed to influence the will or to obtain the cooperation of the child. Atropine and massage of the bladder were the only measures found to be effective in the treatment of true enuresis.

Sickle Cell Anemia in New York.—Wollstein and Kreidel assert that in New York, sickle cell anemia is as common as it is in cities of the South and West. In a series of fifteen negro children whose blood showed sickle cells, twelve were in the active phase and three were in the latest phase. In three of the active cases, the patients died of the anemia without other anatomic cause for death. All showed fatty degeneration of the myocardium and liver, distention of the sinuses of the spleen with sickle cells, phagocytosis of the sickle cells by Kupffer cells in the liver and iron pigment in the spleen, liver and kidneys. In two latent cases, the patients died of tuberculosis and in one the patient died of pneumococcus meningitis. Syphilis was present in one child of the series.

Allergy in Three Weeks' Old Infant.—Lyon reports a case of early acquired rather than inherited or congenital sensitivity. The interesting features of this case were: (1) secretion of allergens in the mother's breast milk with resulting allergic manifestations in an infant sensitive to these allergens; (2) the sensitivity in an infant and the lack of sensitivity in the mother as evidenced by the allergic reactions and protein skin tests; (3) the influence of the epinephrine solution (1:1,000) on the condition when administered orally; (4) the sensitivity to white navy beans present in the child after two years, showing that there had not been complete desensitization; (5) the inability to demonstrate the secretion of these allergens in the milk of a cow fed liberally on a diet containing white navy beans and corn; (6) a sequela to an incomplete diet, which has not previously been pointed out. The diet was incomplete mainly because of the poor geographic and poor economic surroundings of the family. The fact that the child reacted to white navy beans but could eat fresh string beans without allergic manifestations suggested that there is a different protein structure or "body" in the two foods. The use of epinephrine solution with the withdrawal of the offending proteins from the mother's diet gave the best results.

Am. J. Roentgenol. & Radium Therapy, New York

20: 303-404 (Oct.) 1928

*Value of Roentgen Therapy in Primary Malignant Tumors and Benign Giant Cell Tumor of Bone. W. A. Evans and T. Leucutia, Detroit. —p. 303.
Physical and Biologic Problems in Heliotherapy: III. Calibration of Mercury Vapor Lamp in Reproducible Units for Clinical Purposes. E. A. Pohle, Madison, Wis., and R. A. Sawyer, Ann Arbor, Mich. —p. 338.
*Roentgenograms of Abdominal Viscera. R. O. Moody and R. G. Van Nuys, Berkeley, Calif.—p. 348.
*Cholecystography and Transduodenal Biliary Drainage. W. Snow, New York.—p. 358.
Bronchohepatic Fistula with Roentgenoscopic Observations: Case. J. M. Flynn and S. L. Warren, Rochester, N. Y.—p. 364.
*Foreign Body Impacted at Duodenojejunal Flexure. J. E. Habbe, Milwaukee.—p. 370.
Simple Table Attachment for Groedel Technic for Pulmonary Tuberculosis, and for Lateral Upright Chest Examinations. G. E. Pfahler, Philadelphia.—p. 380.
Simple Serialgraph Device. L. H. Levy, New York.—p. 381.

Value of Roentgen Therapy in Bone Tumors.—Five years have now elapsed since bone tumors were first treated by roentgen therapy by Evans and Leucutia. On the basis of the results obtained, therefore, they attempt to prove that the roentgen ray used alone, or in combination with other methods, is one of the most powerful therapeutic agents in the treatment of malignant primary bone tumors. The treatment of benign giant cell tumors is also included here. All cases reported are registered with the Registry of Bone Sarcoma of the American College of Surgeons, and the diagnosis is that of the Registry Committee. Instances are cited to prove that "five year cures" are possible even in patients with extensive metastases and in whom no other methods of treatment could be of benefit. It is the contention of the authors that the present standard methods of treatment of bone sarcoma and of benign giant cell tumors need a complete revision. Irradiation, in the form of deep roentgen therapy, should find a more extensive application in all forms of bone sarcoma and giant cell tumor, operable or inoperable, whether in combination with surgical measures, mixed toxins or the more recent lead therapy.

Roentgenograms of Abdominal Viscera.—The results of a roentgenologic study of the normal form, position and topography of the liver and spleen are presented by Moody and Van Nuys. They state that long livers having their lower tip in the pelvic cavity as much as 5.0 cm. below the interiliac line are normal. Sex is a factor that affects the length of the liver. More men than women have long livers. A roentgenographic norm has been established for the size of the spleen in healthy young adults. The lower border of the spleen is most commonly found opposite the upper half of the third lumbar vertebra. Long spleens having their lower border on a level with the lower half of the fourth lumbar vertebra are normal. These long spleens are found in individuals in whom there is no history of malaria. Sex is a factor that affects the length and the shadow width of the spleen. More men then women have long spleens and more men than women have a wide spleen shadow. There is strong evidence that in human beings the spleen is considerably larger in the living than in the dead. There is some evidence that exercise decreases the size of the spleen in man and that the loss of blood given for transfusion decreases the size of the spleen in man.

Cholecystography and Transduodenal Drainage.—This study by Snow is based on a series of 800 patients in whom cholecystographic examinations were carried out by the oral administration of tetraiodophenolphthalein. All were suspected of having gallbladder disease; 150 had, in addition, transduodenal biliary drainage, and 135 of these were operated on. In more than 90 per cent of the patients in whom duodenal drainage and the Graham test were performed, similar results were obtained so far as they both pointed to a normal or abnormal condition. A gallbladder that gives a normal Graham test and a normal duodenal drainage test is usually normal at operation. Failure to obtain B bile (gallbladder bile) by the drainage test usually means failure to visualize the gallbladder with dye and a pathologic gallbladder at operation. Patients with gallbladder disease who have stones, either calcified or radiotransparent, usually yield pathologic bile by the drainage test and often no B bile. Visualization of the gallbladder without dye is not of diagnostic aid. A large gallbladder, however, which visualizes faintly before and after dye and does not empty after fatty food means a definite pathologic condition—in these cases a hydrops of the gallbladder. The drainage test did not yield any B bile in the author's cases. Snow feels that the surgeon should have other strong indications before operating on patients who have abnormal A, B or C bile and whose gallbladder shadows show adhesions or poor emptying.

Nail Impacted at Duodenojejunal Flexure.—The foreign body in Habbe's case was a nail, 1¾ inches long, which was impacted in the terminal duodenum for a period of approximately three weeks. The patient remained symptom-free throughout the entire period of its lodgment. After failure of expectant and medical therapy over a three week period, operative removal was performed.

American J. Surgery, New York

5: 321-432 (Oct.) 1928

*Sodium Salts of Iodosobenzoic and Iodoxybenzoic Acids in Diseases of Bacterial Origin. G. L. Rohdenburg and C. Reich, New York.—p. 321.
Extraperitoneal Ureterovesicostomy for Postoperative Uretero-Abdominal Fistula. DeW. Stetten, New York.—p. 325.
Improved Colostomy Spur Crusher. DeW. Stetten, New York.—p. 327.

Acute Gangrenous Appendicitis: Peritoneal Sepsis with Hyperpyrexia: Recovery. W. Meyer, New York.—p. 329.
Treatment of Postoperative Infection of Eye. R. Denig and J. J. Reid, Jr., New York.—p. 332.
Acute Appendicitis. C. Eggers, New York.—p. 335.
*Cervical Stump Carcinoma Following Supravaginal Hysterectomy. A. Stein, New York.—p. 340.
Welch Bacillus Infection Complicating Compound Fracture. N. K. Benton, New York.—p. 345.
Oral Cholecystography. W. H. Stewart and H. E. Illick, New York.—p. 349.
Cancer of Face. H. W. Meyer, New York.—p. 352.
*Intra-Uterine and Extra-Uterine Pregnancy. F. R. Oastler, New York.—p. 358.
*Pregnancy and Hemorrhage into Ovarian Cyst. F. R. Oastler, New York.—p. 359.
*Large Renal Calculus. H. A. R. Kreutzmann, San Francisco.—p. 360.
*Trauma and Bone Sarcoma. P. Stephens, Los Angeles.—p. 364.
Diverticulosis of Vermiform Appendix. G. T. Pack and I. Scharnagel, Tuscaloosa, Ala.—p. 369.
Medical Aspects of Chronic Appendicitis. A. F. R. Andresen, New York.—p. 372.
End-End to Side Anastomosis. A. V. Partipilo, Chicago.—p. 378.
Electrocoagulation and Desiccation in Proctology. I. M. Brenner, New York.—p. 381.
Operative Treatment of Legg-Perthes' Disease. R. Whitman, New York.—p. 385.
*Epiphyseal Coxa Vara. M. K. Smith, New York.—p. 387.
*Roentgenographic Demonstration of Fractured Neck of Femur. H. B. Philips, New York.—p. 392.
*Anesthetic Mixture for Short Operations. H. G. Holder, San Diego, Calif.—p. 394.
*Vesical Diverticulum Containing Large Number of Calculi Associated with Impacted Urethral Calculi. W. C. Stirling, Washington, D. C., and J. C. Walton, Cherrydale, Va.—p. 395.
Postoperative Volvulus of Cecum. H. M. Nelson, Detroit.—p. 398.
Biliary Fistula. A. H. Bissell, Stamford, Conn.—p. 400.
Inversion of Tumor of Meckel's Diverticulum in Double Ileocecal Intussusception. H. B. Eisberg, New York.—p. 401.
Pelvic Tumors with Associated Urologic Symptoms. G. A. Cashman, New York.—p. 404.
Sarcoma of Bladder: Two Cases. C. T. Stepita, New York.—p. 406.
Aberrant Pancreatic Tissue Simulating Duodenal Ulcer. H. W. Cave, New York.—p. 407.
Intussusception. H. W. Cave, New York.—p. 409.
Suppurative Arthritis. E. J. Donovan, New York.—p. 410.
Shelf Operation: Two Cases. A. Whitman, New York.—p. 411.

Sodium Salts of Iodosobenzoic and Iodoxybenzoic Acids in Bacterial Diseases.—Rohdenburg and Reich conducted animal experiments in the use of these salts and conclude that further work in the application of these drugs seems indicated. Such work must take into consideration the fact that each organism will probably have a different dosage for maximum results. The investigations were transferred to the treatment of various types of infection in man. Two per cent stock solutions of the sodium salts of the two acids were prepared. They were not boiled. For use, the stock solutions were diluted from ten to forty times with tap water, permitted to stand for several hours and then applied therapeutically. Clinicians reported on their use of these solutions as follows: In gonococcus infection of the genital organs the solution (iodoso) was without value in that gonococci were not caused to disappear from the discharges when the solution was used in strengths as concentrated as 1:1,000. The solutions were said to be nonirritating and nonstaining. In mouth infections about the teeth with Vincent-Plaut organisms, strengths of from 1:1,000 to 1:2,000 (iodoso) cured the condition notably in recurrent cases in which arsenicals and other antiseptics had failed. In the surgical services the iodoso solution was used in a strength of 1:20,000 on open wounds to which wet dressings would ordinarily have been applied. It acted equally well regardless of the organisms responsible for the infection. There were no constitutional symptoms referable to its use, and no untoward local reactions. There was at no time irritation of the tissue or the surrounding skin, nor did the patients complain of burning or pain following its use. It was particularly noted that the solution seemed to clean up wounds more quickly than is usually the case. Old granulating wounds with suppurative discharge which were being prepared for skin grafting were cleared up and made ready in a few days. The sluggish wounds on amputation stumps in cases of thrombo-angiitis obliterans improved and showed red granulations in a shorter time than usual. Sloughing wounds, such as carbuncles, cleared up more rapidly and the odor was less. The important thing was to bring the solution into contact with all parts of the wound. The authors have injected 2 cc. of the iodoxy salt intravenously, every twelve hours, in five cases of streptococcus sepsis. All these patients were practically moribund before receiving the first injection, and all died within forty-eight hours after the first dose. In another case of *Streptococcus viridans* infection, a total of 200 cc. of the iodoxy salt was given intravenously during a period of twelve days without affecting the usual course of the disease. In one case of hemolytic streptococcus blood infection resulting from a carbuncle, five injections (iodoso) were given at twelve hour intervals, the dose being 2 cc. The blood became sterile on the fourth day after injections were started, and the patient recovered.

Carcinoma of Cervical Stump.—Stein reports two cases of carcinoma of the cervical stump developing after supravaginal hysterectomy. The first was a case of adenocarcinoma, occurring six years after operation for uterine fibromyomas. The growth was not extensive and the stump was easily enucleated. The second case was one of carcinoma of the anterior lip of the cervix, occurring in a woman, aged 55, twenty-three years after subtotal hysterectomy. The first symptom was sudden profuse bleeding from the vagina.

Simultaneous Intra-Uterine and Extra-Uterine Pregnancy.—Oastler reports a case of double pregnancy, extra-uterine and intra-uterine, the two evidently beginning at the same time. The patient complained of repeated attacks of sharp pains in the left lower abdominal quadrant. There never was any uterine bleeding. Finally she presented all the symptoms of severe internal hemorrhage. An immediate operation was performed. The abdomen was found to be filled with blood and a left-sided ectopic gestation of about two months' duration was removed. The uterus was somewhat enlarged and soft. A transfusion of 500 cc. of blood was given. There had not been vaginal bleeding at any time. Convalescence was stormy but not unusual, except for constant nausea. The patient was up on the fourteenth day. Pelvic examination showed an enlarged uterus and soft cervix. Intra-uterine pregnancy was suspected. At about five and one-half months she aborted, without complication.

Pregnancy and Hemorrhage Into Ovarian Cyst.—Two years before she became pregnant, Oastler's patient had her right ovary removed. When she was about two months' pregnant, she developed symptoms which led to a diagnosis of ectopic gestation. At the operation, a small ovarian cyst containing fresh blood was removed. The uterus was enlarged, soft and dark. The abdomen was closed. Twenty-four hours following operation, vaginal bleeding ceased. The patient had an uneventful recovery, except for continued nausea and gas. She was delivered of a normal healthy baby at about term. The case is of interest from the standpoint of differential diagnosis and because it shows that pregnancy can continue to term without the presence of ovaries.

Renal Calculus of Unusual Size.—Kreutzmann removed a kidney 15.5 cm. in length, 9 cm. in width, and 6 cm. in thickness. It was filled with large stones, one of which was protruding from the pelvis. The total mass weighed 650 Gm. There was also a separate piece of pelvic tissue which, when spread out, covered an area of 5 by 2 cm. The large stone extended into all calices and their ramifications. It was fractured in three separate places, thus giving the appearance of multiple calculi. Some of the calices were obliterated beyond the stone and contained blood-tinged purulent material. The actual kidney substance varied in thickness from 0.4 to 1.5 cm. The stone was composed almost entirely of uric acid.

Trauma and Bone Sarcoma.—Stephens is convinced that continual irritation or moderate force has a tendency toward the development, or at least the activation, of the growth of bone tumors, but there is, he says, little if any evidence from which one can conclusively assume that such tumors are developed through one act of trauma in which the force is moderate or severe.

Epiphyseal Coxa Vara.—Smith believes that epiphyseal coxa vara is a well defined entity that has not been as generally understood nor as frequently recognized as its importance merits. While static and traumatic causes probably play a part, it is best explained on the basis that there is softening at the junction of the epiphyseal cartilage and neck. The occurrence of endocrine types in a number of these patients suggests as a possible explanation abnormality of bony growth. In an adolescent, particularly a boy of a stout type, who complains of pain in the

hip associated with limp without adequate traumatic basis, this condition should be considered and a roentgenogram made, as well as a careful physical examination. If such a patient suffers a sudden complete disability with eversion and shortening of the leg, an acute epiphyseal separation has probably occurred.

Roentgenography of Fracture of Femur.—To demonstrate the neck of the femur without any overlapping shadows whatever, Philips resorts to the very simple expedient of internally rotating the femur and holding the foot inward, immobilizing it in this position during the exposure. It is possible thus to procure roentgenograms which will show the entire neck of the femur without any superimposed shadows.

Anesthetic Mixture for Short Operations.—For the performance of painful dressings in the hospital, the reduction of fractures, minor surgery or difficult gynecologic examinations in the office or home, Holder uses an anesthetic mixture containing chloroform, 0.5 cc.; ether, 24.0 cc.; ethyl chloride, 5.5 cc., and oil of orange, 0.25 cc., each in itself innocuous but combined producing a safe and efficient mixture. For induction 1 ounce (30 cc.) is poured on a sufficiently large portion of cotton and slowly lowered over the nose, the eyes being protected with a towel. The oil of orange masks the disagreeable odor of the other constituents, so that patients seldom complain. When the patient has become accustomed to this initial procedure, an ordinary rubber bathing cap is stretched over the chin and forehead, acting as a rebreathing bag. Respiration is stimulated by rebreathing of exhaled carbon dioxide, the mixture being rapidly inspired with resultant instantaneous anesthesia. Anesthesia will last from five to ten minutes, care being taken not to allow patients to become cyanotic. After the bathing cap is removed, consciousness is rapidly restored. There are no disagreeable sequelae to the anesthetic. This method has proved very satisfactory in adults and children for a variety of short procedures.

Vesical Diverticulum Containing Calculi.—The unusual feature in the case reported by Stirling and Walton was the large number of stones which the patient had voided and the fact that 129 calculi were removed from the bladder and urethra. All the stones were practically the same size, character and composition. They were round, smooth and phosphatic in origin, and were undoubtedly the result of urinary stasis in the diverticulum accompanied by moderate enlargement of the prostate. Twenty-four stones were found impacted in the urethra at the penoscrotal junction. One scrotum had sloughed through the urethra from pressure necrosis and had become separated from the remaining cluster. This was followed by urinary extravasation into the scrotum.

Archives of Neurology and Psychiatry, Chicago

20: 895-1150 (Nov.) 1928

Mammalian Cerebellum: Arbor Vitae and Folial Pattern. H. A. Riley, New York.—p. 895.
Cerebral Circulation: V. Pial Circulation During Changes in Intracranial Pressure. H. G. Wolff and H. S. Forbes, Boston.—p. 1035.
Physiologic Mechanism for Maintenance of Intracranial Pressure: Secretion and Absorption of Cerebrospinal Fluid: Relation of Variations in Circulation. H. S. Howe, New York.—p. 1048.
Acute Swelling of Oligonendroglia and Grapelike Areas of Disintegration. A. Ferraro, New York.—p. 1065.

Archives of Surgery, Chicago

17: 715-898 (Nov.) 1928

*Venous Abnormalities and Angiomas of Brain. W. E. Dandy, Baltimore.—p. 715.
*Ligation of Terminal Abdominal Aorta. B. Brooks, A. Blalock and G. S. Johnson, Nashville, Tenn.—p. 794.
*Ossification After Fracture. I. S. Ravdin and M. E. Morrison, Philadelphia.—p. 813.
*Intramedullary Lipoma of Spinal Cord. E. Sachs and E. R. Fincher, Jr., St. Louis.—p. 829.
*Bactericidal Properties of Solution S. T. 37 (Liquor Hexylresorcinolis 1:1,000). A. W. Allen and I. S. Wright, New York.—p. 834.
*Function of Diaphragm. W. S. Lemon, Rochester, Minn.—p. 840.
Surgical Significance of Abdominal Reflexes. W. Klein, New York.—p. 854.
*Relation of Bacillus Welchii Antitoxin to Toxemia of Intestinal Obstruction. J. J. Morton and S. J. Stabins, Rochester, N. Y.—p. 860.
Review of Urologic Surgery. A. J. Scholl, Los Angeles, and Others.—p. 872.

Venous Abnormalities and Angiomas of Brain.—Twenty-four cases of venous anomalies, plexiform angiomas, angiomatous cysts and cavernous angiomas of the brain are reported by Dandy. Additional cases of similar types have been collected from the literature, and their clinical features are analyzed. The venous anomalies are of congenital origin. Their clinical symptoms are usually epilepsy and disturbances of mentality. They are frequently associated with other deformations of the brain. Three cases of angioma plexiforme are reported. They resemble a similar lesion well known in the spinal cord. A network of venous spaces in the dura and communicating freely with the longitudinal sinus is offered as a cause of focal epilepsy beginning in the leg or arm. Its constant location suggests that it is probably the congenital remains of an embryonic dural circulation. Angiomatous cysts exist throughout the brain, but occur with greatest frequency in the cerebellum. The size of the tumor embedded in the wall of the cyst is relatively insignificant. Intracranial pressure develops rapidly because of the cyst formation and the resultant hydrocephalus. Localizing symptoms are usually, but not always, present. These tumors cannot be differentiated clinically from other types of cysts of the brain. Cavernous angiomas assume many gross appearances. They are scattered throughout the brain, but appear to occur with greatest frequency in the frontoparietal region. The predominating symptoms of this type of tumor is jacksonian epilepsy with or without transient or permanent motor weakness. Pressure symptoms will develop if the tumor begins early in life; they grow slowly, and the symptoms endure for many years. A clinical diagnosis can be made at times. Hemorrhage from the tumor is always a potential danger in all types of angiomas, though to a less degree than in arteriovenous aneurysms of the brain. Both the cavernous angiomas and the angiomatous cysts should be treated surgically by complete removal of the solid tumor together with a margin of contiguous brain tissue. Both of these types of tumor offer good prospects of complete cure and with relatively little risk. The tumors in the cysts are among the easiest tumors of the brain to extirpate.

Effect of Ligation of Abdominal Aorta.—The effect of experimental occlusion of the abdominal aorta on the blood pressure, the cardiac output and the distribution of the blood volume was studied by Brooks et al. The experiments show that the cardiac output is decreased. There is little, if any, change in the blood pressure in the artery proximal to the occlusion. Immediately following the occlusion there is a transfer of the blood volume from the distal to the proximal aspect of the obstruction. In the experiments conducted for this study in which the experimental animals were examined after relatively long periods had elapsed since the occlusion of the aorta, no evidence was found of hypertrophy of the heart.

Ossification After Fracture.—A study was made by Ravdin and Morrison of the serum calcium and inorganic phosphorus after fractures in normal, hypercalcemic and hypocalcemic dogs. They have not been able to prognosticate the rate of ossification after fracture from the calcium and phosphorus product, from the ion product or from the negative logarithm of the ion product. The marked decrease in serum calcium after thyroparathyroidectomy retarded ossification, although it did not prevent union.

Intramedullary Lipoma of Spinal Cord.—The outstanding symptom in the case reported by Sachs and Fincher was an inability to lift the feet because of weakness. There was a diminution in sensation to light touch, pinprick and heat and cold from the twelfth dorsal skin segment down. A band of complete anesthesia, corresponding to the tenth and twelfth dorsal skin segment, was present. The abdominal reflexes were absent and the cremasteric reflexes rather feeble. The patellar and ankle jerks were increased. A bilateral Oppenheim sign was elicited. There was a slight spasticity of the lower extremities, but patellar or ankle clonus was not present. The rest of the physical examination gave negative result. An injection of iodized oil, 40 per cent, was made. Roentgen examination showed that the greater part of the 1.5 cc. of oil, injection of which had been made into the cisterna magna, had dropped to the bottom of the canal. However, in the middorsal region, streaks of oil were lodged on each side of the canal. The point at which the globules were lodged corresponded to the level of the lesion as determined by neurologic examination. When the dura was opened, the cord was found distended by a yellowish mass beneath the arachnoid which had running over it fine longi-

tudinal bands of tissue from the spinal cord. Careful retraction revealed an encapsulated lipoma, which was readily peeled out of the substance of the cord. After the tumor had been removed, a shallow ovoid cavity remained in the cord. The patient was discharged from the hospital two weeks after operation. There was spasticity of the lower extremities, just as there had been before operation, but he was able to walk with the aid of a cane.

Bactericidal Properties of Liquor Hexylresorcinolis.—Experiments made by Allen and Wright show that liquor hexylresorcinolis (S. T. 37) is not effectively bactericidal for *Bacillus pyocyaneus* in forty-eight hours or less. It is bactericidal for *Staphylococcus aureus* in some time under ninety minutes and destroys *Streptococcus hemolyticus* in less than fifteen minutes.

Function of Diaphragm.—Lemon relates a number of facts which would lead one to believe that the providing of pressure is the chief and primary function of the diaphragm and that its purpose as a partition is to allow the increased pressure to act on abdominal viscera, permitting them to discharge their contents (fecal matter, urine and offspring), while at the same time the heart and lungs are spared the effects of the same pressure. It would appear that animals such as the dog can maintain respiratory efficiency without impairment when half of the diaphragm has been paralyzed and even when both sides are functionless and, in fact, a hindrance to respiration. In such animals the diaphragm does not compare in functional importance with the heart. Man can live comfortably when half the diaphragm is paralyzed, and he suffers only a slight loss in vital capacity. It seems probable that this loss is quickly made up by factors of compensation. It is probable that respiration is maintained as a result of a mechanical process operated by the combined movements of various sets of muscles so coordinated and controlled as to make possible an exchange of air sufficient not only at rest but also under effort. It seems probable that groups of muscles can be rendered functionless without disturbance of respiration as a whole or the action of other groups separately. The loss in vital capacity varies with the degree of muscular dysfunction.

Relation of Welch Bacillus to Toxemia of Intestinal Obstruction.—Experimental evidence has been educed by Morton and Stabins to support the contention of Williams that the toxin of *B. welchii* has a bearing on the toxemia of intestinal obstruction. In a large number of cases, the antitoxin of *B. welchii* seems to be potent, in combination with surgical procedures, to relieve the obstruction in bringing about the recovery of dogs with obstructions. Control dogs do not recover under similar circumstances. The antitoxin seems to be specific in its action, as other forms of antitoxin and serum are not effective. These experiments give only indirect evidence that the toxin of *B. welchii* is concerned. Additional experiments on the direct effect of the toxin are being conducted.

Colorado Medicine, Denver

25: 339-382 (Nov.) 1928

Status of Calmette (B C G) Vaccination Against Tuberculosis. M. Katzman, Denver.—p. 341.
Treatment of Tabetic Neurosyphilis. G. A. Moleen, Denver.—p. 352.
Partial Gastrectomy for Peptic Ulcers Coincident with Lymphosarcoma of Stomach: Recovery. L. Freeman, Denver.—p. 362.
Treatment of Diabetes During Pregnancy. R. M. Wilder and E. Parsons, Rochester, Minn.—p. 372.

Illinois Medical Journal, Oak Park

54: 325-400 (Nov.) 1928

Ureteral Stricture. B. C. Corbus, Chicago.—p. 341.
Gonorrhea in Male: Analysis of 1,000 Cases. L. M. Beilin, Chicago.—p. 345.
Spontaneous Cerebral and Meningeal Hemorrhage in Young Adults. L. H. Sloan and C. L. Bidwell, Chicago.—p. 350.
Toxemias of Pregnancy. J. O. Polak, New York.—p. 352.
Physiology of Stomach and Duodenum. J. D. Koucky, Chicago.—p. 357.
Investigation of Sterile Couple. I. F. Stein, Chicago.—p. 359.
Diagnosis and Treatment of Nervous Dyspepsia. L. D. Cady, St. Louis.—p. 364.
Membranous Colitis Due to Rectal Gonorrhea. W. A. Marshall, Chicago.—p. 368.
Surgical Correction of Crooked Nose. S. Salinger, Chicago.—p. 368.
Movable Kidney. L. W. Bremerman, Chicago.—p. 373.
Eye in Relation to General Diseases. M. Wiener, St. Louis.—p. 377.
Treatment of Gonorrhea in Some European Clinics. J. S. Grove, Chicago.—p. 381.
Lung Abscess. L. E. Handelman, Chicago.—p. 385.
Ovarian Transplantation: Forty-Four Cases. M. Thorek, Chicago.—p. 389.

Iowa State M. Society Journal, Des Moines

18: 417-452 (Nov.) 1928

Eye Disorders of Nasal Origin. F. L. Wahrer, Marshalltown.—p. 417.
Otosclerosis. J. A. Downing, Des Moines.—p. 421.
Origin of Nasal Deflections. H. M. Ivins, Cedar Rapids.—p. 428.
Modified Resection of Nasal Septum. F. H. Roost, Sioux City.—p. 432.
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Journal of Urology, Baltimore

20: 521-634 (Nov.) 1928

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Kansas M. Society Journal, Topeka

29: 355-390 (Nov.) 1928

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Use of Compressed Air as Therapeutic Agent. C. F. Nelson, Lawrence.—p. 370.
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Michigan State M. Society Journal, Grand Rapids

27: 693-792 (Nov.) 1928

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Compound Fracture of Femur: Case. D. C. Durman, Saginaw.—p. 699.
Present Status of Diagnosis and Treatment of Cancer. H. C. Saltzstein, Detroit.—p. 701.
Medical Education in England, France and Germany. E. Nittis, Berlin.—p. 704.
Otolaryngology at Vienna Clinics. S. E. Barnett, Detroit.—p. 707.
History of Pediatrics. B. R. Hoobler, Detroit.—p. 709.
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Proposed Research in Epilepsy. R. D. Dixon, Wahjamega.—p. 715.
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Journey to Soviet Russia. L. Dretzka, Detroit.—p. 724.

New England J. Medicine, Boston

199: 915-966 (Nov. 8) 1928

Story of Altro Work Shops. E. Hochhauser, New York.—p. 915.
Place of Industrial Colony in Getting Consumptive Back on Job. B. T. Crane, Rutland, Mass.—p. 918.
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Relative Position of Diabetes as Cause of Death in Massachusetts from 1902 to 1927. A. D. Hamblen and E. P. Joslin, Boston.—p. 933.
Height, Weight and Intelligence Relationships in 3,553 Retarded School Children. N. A. Dayton, Boston.—p. 934.
Diphtheria Deaths in Massachusetts During 1927. E. A. Lane, Boston.—p. 939.
Injection Treatment of Varicose Veins. H. F. Day and W. S. Levenson, Boston.—p. 944.

New Jersey M. Society Journal, Orange

25: 671-760 (Nov.) 1928

Physical Measures as Adjunct to Surgery. W. Martin, Atlantic City.—p. 671.
Physical Therapy Aids in Fracture and Orthopedic Cases. W. G. Doran, Jersey City.—p. 676.
Present Status of Diathermy in Pneumonia. H. E. Stewart, New Haven, Conn.—p. 688.
Coordinating Physical Therapy Department. S. T. Snedecor, Hackensack.—p. 692.
Ultraviolet Rays in Treatment of Ear, Nose and Throat Conditions. C. R. Brooke, Newark.—p. 695.
Spreading Ulcer of Cornea. D. M. Yazujian, Trenton.—p. 699.
Annual Winter Infections of Respiratory Tract in Childhood. A. Stern, Elizabeth.—p. 704.
Pediatric View of Pyuria. F. C. Johnson, New Brunswick.—p. 710.
Duodenobiliary Drainage (Nonsurgical). M. Asher, Newark.—p. 715.
Analysis of 250 Gallbladder Operations. M. Danzis, Newark.—p. 718.

Public Health Journal, Toronto

19: 501-550 (Nov.) 1928

Some Great Contributions to Public Health. G. D. Porter, Toronto.—p. 501.
Safeguarding Milk Supply. A. E. Berry, Toronto.—p. 505.
Division of Child Welfare: Department of Pensions and National Health. H. MacMurchy, Ottawa, Ont.—p. 514.
Mental Health. G. H. Stevenson, London, Ont.—p. 522.
Collection of Vital Statistics in Quebec. P. Parrot, Quebec.—p. 528.

Public Health Reports, Washington, D. C.

43: 2817-2881 (Oct. 26) 1928

Increased Susceptibility of Albino Rat Infected with Tubercle Bacillus to Tuberculin. M. I. Smith, Washington, D. C.—p. 2817.

43: 2883-2954 (Nov. 2) 1928

*Oral Administration of Derivatives of Chaulmoogra Oil in Leprosy. N. E. Wayson and L. F. Badger, Washington, D. C.—p. 2883.

Oral Administration of Chaulmoogra Oil in Leprosy.—A preparation of the esters of chaulmoogra oil which can be given by mouth has been used by Wayson and Badger for the past six months in twenty-five patients without discomfort to the patient, and without noticeable gastro-intestinal symptoms. The preparation is an emulsion in acacia and simple syrup of equal parts of the mixed esters of chaulmoogra oil, and of cod liver oil to which iodine is added to make 0.06 per cent. The mixture is of about the same consistency as that of the U. S. P. emulsion of cod liver oil, remains emulsified, and apparently does not deteriorate during periods of six weeks at room temperature. The dose has been started at 1 or 2 cc. of the mixture and gradually increased. Tentatively the maximum dosage to be used has been set at 10 cc. of esters weekly per hundred pounds weight of patient. A few patients have interrupted their dosage for a day or two because of vomiting, but invariably they have found that the adjustment of the time of the dose in relation to their breakfast was all that was necessary. Some take the dose before breakfast and others after the meal. Several state that they have some eructation in which they taste the cod liver oil until the next meal. The therapeutic value of the treatment must be reported on after a sufficient length of time has elapsed.

Radiology, St. Paul

11: 361-446 (Nov.) 1928

Prognostic Value of Histologic Malignancy Index and Clinical Grouping of Carcinomas of Uterine Cervix. H. Schmitz and W. Hueper, Chicago.—p. 361.
*Chemical and Biologic Changes Induced by Roentgen Rays in Body Tissues. M. T. Burrows, L. H. Jorstad and E. C. Ernst, St. Louis.—p. 370.
Cancer Cell in Practice of Medicine. W. C. MacCarty, Rochester, Minn.—p. 379.
Cancer Biology and Radiation. F. C. Wood, New York.—p. 388.
*Direct and Indirect Action of Radiation on Cancer Tissues. A. Lacassagne, Paris.—p. 393.
Review of Various Methods of Treatment of Carcinoma of Cervix: Attendant Primary Mortality and Five-Year Cures. M. J. Gelpi, New Orleans.—p. 403.
Radiography of Normal Larynx. P. M. Hickey, Ann Arbor, Mich.—p. 409.
Bronchography According to Passive Technic: Method of Choice for Roentgenologist. A. Ochsner, New Orleans.—p. 412.
Some Physical Properties of Fluorescent Screens. F. E. Swindells, Towanda, Pa.—p. 424.
Pregnancy Complicated by Carcinoma of Uterine Cervix: Case. W. Neill, Jr., Baltimore.—p. 429.

Changes Induced by Roentgen Rays in Body Tissues.—Burrows et al. show that one of the actions of roentgen rays on the tissues is to remove their normal lipoid content and that one of the chief actions of roentgen rays in destroying cancer may be the removal of these lipoids, not only from the cancerous tissues but also from the normal tissues immediately adjacent to them. These lipoids are necessary substances for the growth of the cancer cells. Without them, the cancers degenerate quickly.

Action of Radiation on Cancer Tissue.—Clinical teaching and the results of treatment lead Lacassagne to believe that, in cancer, as in normal tissues, radiation acts by damaging the cells directly and electively. If the goal of the radiotherapy of malignant tumors should above all be the destruction of the neoplastic cells, the importance of preserving the general tissues should not be forgotten. The most important condition for success is to administer to all the cancer cells the strongest dose compatible with the integrity of the healthy tissues.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Lancet, London

2: 903-956 (Nov. 3) 1928

Pyelitis and Pyelonephritis. A. G. Gibson.—p. 903.
Symptoms Due to Mesenteric Lymphadenitis. A. R. Short.—p. 909.
*Range of Urea-Concentration Test. T. C. Hunt.—p. 912.
*Mechanistic Conception of Eclampsia. R. H. Paramore.—p. 914.
Cancer of Stomach. G. Vilvandré.—p. 917.
Removal of Adenomas of Rectum. H. H. Greenwood.—p. 918.
*Result Following Injection Treatment of Varices. F. Reynolds.—p. 919.
Pyelolithotomy Forceps. W. K. Irwin.—p. 919.

Urea Concentration Test.—Calvert's original test is considered to be incomplete in certain respects by Hunt. It may give fallacious results and should therefore be combined as a routine with urine estimations, as in Volhard's test. The hourly output should always be measured and its specific gravity noted until the total amount of fluid given (30 ounces or 890 cc.) is excreted, or until at least ten hours has elapsed. Even in its original form, however, Calvert's test can often be of help. The criticism that has been leveled at MacLean's test—that it does not detect renal insufficiency until it is somewhat pronounced—Hunt says, can be applied with less justice to Calvert's test, which is sometimes able to detect changes pointing to early contraction of the kidney before MacLean's test arouses suspicion. In acute nephritis, only the severer grades show impairment of function by Calvert's test, but its value should be most apparent in subacute parenchymatous nephritis or "large white" kidney.

Mechanistic Conception of Eclampsia.—A study of the levator ani muscles led Paramore to appreciate the significance of intra-abdominal pressure and to form the mechanistic conception of eclampsia, which is fundamentally based on evolutionary metabolic deductions. It had been thought that the levator ani muscles in man are simply vestigial structures, representative of tail-moving muscles in tail-bearing ancestors of man. Inquiry showed that this view was altogether untenable; that their essential purpose is to guard the pelvic outlet, acting in many animals as an obturator preventing visceral escape, especially during activity. The only explanation of the flank muscles of the abdomen was (and is) that for some reason they compress the abdominal viscera. The existence of the flank muscles explained the existence of the levator ani. Obviously, the flank muscles could not create much pressure within the abdomen if the viscera were not prevented from being extruded from the pelvis. Nor could the abdomen wall contract much if the epigastric viscera were not prevented from entering the chest. Thus, the diaphragm appeared as an antagonist of the abdominal wall, creating with it a positive pressure within the abdomen, and not simply as an antagonist of the thoracic wall, participating in the production of a negative intrathoracic pressure. Plainly, the negative pressure in the chest and the positive pressure in the abdomen are correlated for some end. Intra-abdominal pressure works in two ways. First, it affects the cardiac output by affecting the volume of blood returned per unit of time; secondly, it affects the capillary blood flow in the abdomen, by compressing the visceral capillaries. The conception that the intra-abdominal pressure is related to general metabolism, Paramore says, seems warranted; therefore changes in this pressure, of any duration, should affect general metabolism. Diminution of the average pressure should be associated with diminution of strength and of general activity; increase of the average pressure, within limits, should be associated with increase of strength and capacity for greater work. In practice, this is so. When the average pressure is low, when the muscles causing it have become weak, signs of general debility occur and the individual becomes neurasthenic or worse. An efficient abdominal support converts this cripple into an active and useful person. In the same way, when a woman with weak abdominal walls becomes pregnant, her whole state tends to improve. When the uterus has begun to bulge the abdominal wall, the intra-abdominal pressure rises. As more blood per unit of time is being sent to the heart, more reaches the brain, the limbs and the viscera. The capillary pressure in all parts rises, within an improved capillary blood flow. This explains the general improvement in physique and

the brighter mentality so often noted as a concomitant of pregnancy. But if the pressure exceeds a certain limit, the system must break. Capillaries here and there, and in certain places large tracts, become cut out from the circulation, the blood which should pass through them flowing through paths presenting less resistance. An aberration of metabolism must occur, and pregnancy seems to offer ideal conditions for its production. In the majority of cases, as pregnancy advances the abdominal muscles give way, as is shown by the separation of the recti in the latter part of pregnancy and by the condition of the abdominal wall after labor. But this is not always so; and in strong, busy and active primigravidae a sufficient yielding is especially unlikely. The conception that eclampsia is simply a manifestation of a gravely perverted metabolism due to an excessive compression, preventing visceral activity, is supported by the facts that the levator ani muscles hypertrophy in pregnancy—particularly in primigravidae; that the abdominal wall muscles undergo changes indicating the play of an increased tonic contraction; that the pressure in the rectum becomes raised, in some cases considerably, and that eclampsia occurs most often in the strongest type of woman, with good abdominal walls.

Curious Happening After Injection Treatment of Varicose Veins.—A woman, aged 25 years, was treated by Reynolds for venous varices by the injection of quinine urethane solution. The vein under treatment was the external saphenous, which was markedly varicose from ankle to knee. In about one month the whole vein was obviously thrombosed by the injections. The patient returned eight weeks later for inspection. In place of the now obliterated vein was a remarkable overgrowth of hair which exactly followed in each curve the line of the original vein. The hair differed in two respects from the natural hair of the legs: in the first place it was both longer and denser, and secondly, it was decidedly darker, so much so that the patient suggested that she should shave her leg in the future.

Quarterly Journal of Medicine, London

22: 1-165 (Oct.) 1928

*Arterial Carbon Dioxide Pressure in Cardiac Dyspnea. F. R. Fraser and Others.—p. 1.
*Two Functions in Thyroid Physiology. G. S. Williamson and I. H. Pearse.—p. 21.
*Clinical Application of Total Chloride Estimations in Fractional Test Meal. W. S. C. Copeman and N. G. Hill.—p. 33.
*Dysphagia and Anemia. J. A. M. Cameron.—p. 43.
*Parkinsonian Rigidity. Effect of Stramonium, Hyoscine and Other Alkaloids. E. A. Carmichael and F. H. K. Green.—p. 51
Distribution of Electrolytes in Hemophilic Blood. R. V. Christie, J. Sendroy, Jr., and D. D. van Slyke.—p. 65.
Investigation of Primary Lobar Pneumonia in Manchester, 1925-1927. F. R. Ferguson and R. Lovell.—p. 73.
*Osmotic Pressure of Blood Proteins in Nephritis. C. L. Cope.—p. 91.
Tonsil-Adenoid Operation and Some of Its Results. J. H. P. Paton.—p. 107.
*Addison's Disease with Atrophy of Cortex of Suprarenals. O. Brenner.—p. 121.
Sedimentation Rate of Erythrocytes. H. B. Newham and P. H. Martin.—p. 145.
*Creatinuria as Sequel to Fractures of Bones: Effect of Thyroid Feeding on It and on Creaturia of Postencephalitic Rigidity. M. Hirst and C. G. Imrie.—p. 153.

Artificial Carbon Dioxide Pressure in Cardiac Dyspnea.—Thirty observations on the arterial carbon dioxide pressure have been made by Fraser et al. in seventeen cases of heart failure with dyspnea. It was quite variable. It may be within normal limits or may be below or above these limits. From a consideration of the oxygen saturation, carbon dioxide capacity, and p_H of the arterial blood, and of the condition of the patients at the time of observation, it appears that there must be in cardiac dyspnea a stimulus at the respiratory center independent of the quality of the blood supplied to the center, causing increased pulmonary ventilation with a lowering of the carbon dioxide pressure in the arterial blood. This stimulus may be due to low oxygen tension in the tissues of the center, the result of lowered minute volume of the circulation. In patients with pulmonary disease in addition to heart failure, or with the pulmonary lesions seen in severe congestive failure, the arterial carbon dioxide pressure is raised. This is the result of inefficient pulmonary ventilation or inefficient gaseous exchange in the lungs and masks the effects on the arterial blood of the stimulus mentioned. The raised carbon dioxide pressure will act as an additional stimulus to the respiratory center. In one patient examined shortly before death there was evidence of the retention of nonvolatile acids, causing an increased hydrogen ion concentration and low carbon dioxide pressure in the arterial blood. This would mask the effects on the arterial blood of the stimulus described and act as an additional stimulus to the respiratory center. In some of the patients with normal arterial carbon dioxide pressure, one or both of the factors mentioned were present, in addition to the stimulus, which is present in all cases of cardiac dyspnea.

Two Functions in Thyroid Physiology.—The two functions in thyroid physiology referred to by Williamson and Pearse are: (*a*) the secreting function; (*b*) the iodocolloid function. These functions are not mutually derivative, for it has been shown that iodocolloid cannot be the mother substance of secretion proper, nor secretion proper the mother substance of iodocolloid. The relation of the two functions to exophthalmic goiter is shown by the following observations: The secretory activity of the gland is directly related to the thyrotoxicosis of the disease. The thyrotoxicosis is relieved by simple removal of pure secreting tissue. Iodocolloid function has only an indirect relation to the thyrotoxicosis. An absolute loss of a thyroid reserve of iodocolloid can occur in exophthalmic goiter (48 per cent of cases). This mobilization of colloid depends on some factor in the secretion, for the following reason: When iodine feeding is excluded, excision of pure secreting tissue causes, or allows, a reserve of active normal iodocolloid to reappear in the remainder of the gland. Iodine feeding can also reestablish a reserve of normal active iodocolloid in the gland. However the thyroid reserve of iodocolloid is reestablished, it does not abolish the thyrotoxicosis. There is no absolute lack of circulating iodine in exophthalmic goiter, but a relative lack of circulating iodine may complicate the disease (48 per cent of cases). This relative lack of iodine is relieved by iodine feeding, but the effect on the thyrotoxicosis is not yet clear.

Total Chloride Estimations in Fractional Test Meals.—A group of fifty apparently healthy children between the ages of 8 and 10 were subjected to the fractional test meal by Copeman and Hill, and the results analyzed and compared with those of various observers in adult subjects. They were found to vary in certain respects. It is considered that the usual estimations for free hydrochloric acid and total acidity are not of much clinical value, owing to their variability, even in the same individual, at short intervals. An investigation into the emptying rate of the stomach in these children, as evinced by the disappearance of starch, seems to cast doubt on the common idea that the emptying rate of the child's stomach is more rapid than that of the adult. The current theory that the stomachs of "achlorhydriacs" apparently empty at a faster rate than those of normal persons is, however, borne out, although evidence is produced to show that in these cases the ptyalin of the saliva is much more active; the disappearance of starch is therefore probably not unrelated to this fact in most cases.

Dysphagia and Anemia.—Cameron made blood examinations in eighteen cases of dysphagia. In general the changes in the blood are those of chlorosis or mild secondary anemia, with a constant and considerable reduction in the percentage of hemoglobin. The average red corpuscle count is almost exactly 4 millions. There is no change in the leukocyte count nor in the differential count. Associated with the alterations in the blood there may be enlargement of the spleen. In this series 27 per cent showed quite definite enlargement. The signs of this syndrome are glossitis and atrophy of the oral and pharyngeal mucosae, definite reduction in hemoglobin percentage and some diminution of red blood corpuscles, frequent enlargement of the spleen, and the symptoms, dysphagia referred to the level of the larynx, with loss of appetite, debility and nervousness.

Effect of Scopolamine and Stramonium in Parkinsonism.—In five cases reported by Carmichael and Green, tincture of stramonium was given by mouth. The initial dose in each case was 20 minims (1.2 cc.) thrice daily; this was increased up to 90 minims (5.6 cc.) in two of the patients who showed little or no intolerance to the drug. Two others reached a maximum dosage of 60 minims (4 cc.) and 75 minims (4.5 cc.),

respectively, three times a day, while the third was unable to tolerate more than 45 minims (2.8 cc.) three times a day. Scopolamine hydrobromide, 1/100 grain (0.6 mg.), injected subcutaneously, and stramonium considerably reduced the length of the rigidity curves in each of the patients in whom they were tried. Cessation of treatment for even a few days was sufficient to produce a complete relapse in each type of curve. However, stramonium, as a method of palliative treatment, is more potent than scopolamine by mouth, and possesses obvious advantages over scopolamine subcutaneously. It appears to improve the mental condition. It does not affect the tremor. It is at least as efficient as scopolamine in large doses subcutaneously, is better than scopolamine by the mouth, and may be given continuously over a long period of time. The optimum dosage necessary to produce this effect varies in individual cases, though it commonly lies between 45 and 60 minims (2.8 and 4 cc.) thrice daily. Toxic symptoms even with this large dosage are rarely severe; they may be combated in various ways; they appear to be more common in elderly patients with idiopathic paralysis agitans than in younger patients following encephalitis. The whole tincture of stramonium is more efficacious than atropine or levorotatory or dextrorotatory hyoscyamine.

Osmotic Pressure of Blood Proteins in Nephritis.—The technic of Verney has been employed by Cope to determine the osmotic pressure of the blood plasma proteins in nephritis. In nonedematous nephritis the protein osmotic pressure is unreduced, except slightly just before death; it may, however, be higher than normal, though this rise is not necessarily associated with high blood pressure. In nephritis with edema, a definite fall in protein osmotic pressure occurs, and this disappears coincidentally with the subsidence of the edema. In cardiac failure the protein osmotic pressure may be undiminished when edema is present, or may be found markedly lowered in the absence of demonstrable edema.

Atrophy of Suprarenal Cortex in Addison's Disease.—Five cases of Addison's disease are described by Brenner. In four of them there was a peculiar and characteristic lesion of the cortex, with destruction of most of it. The medulla was little or not at all injured. In the fifth case no suprarenals were found. It is suggested that this may represent the end stage of the process illustrated by the other four cases. It is suggested that the process is a necrosis of cortical cells caused by some unknown toxin which has a special affinity for them. This is followed by focal regeneration, with the production of hyperplastic islands of hypertrophied cells, which are then attacked by the same process. The few cortical cells left after the primary injury are probably overworked, and it is possible that part of the subsequent degeneration is due to this. In many cases of Addison's disease due to suprarenal atrophy or tuberculosis, other endocrine glands are also diseased. In one case the lesion of the thyroid was almost as marked as that of the suprarenals, though there were no symptoms of thyroid disease. In another case there were mild symptomless lesions of the thyroid and testis. In another case there were symptoms and pathologic changes of exophthalmic goiter as well as of Addison's disease. In the other two cases the other endocrine glands were not examined. The pathologic evidence as to the relative importance of the cortex and medulla is reviewed. It is shown that the symptoms of Addison's disease occur only when most of the cortex is destroyed, and that they occur then even if the medulla and the chromaffin system are normal. On the other hand, the chromaffin system may be particularly absent, and if the cortex is normal there are no symptoms of Addison's disease. The inference is drawn that the symptoms are due to disease of the suprarenal cortex and not to disease of the medulla or of the chromaffin system as a whole.

Creatinuria as Sequel to Fractures of Bones.—Hirst and Imrie assert that creatinuria occurs after fracture of bones. The amount of creatine found to be excreted in twenty-four hours in different cases has varied from traces to more than 500 mg. It disappears gradually from the urine as healing takes place and the patient is up and about. The hourly rate of excretion is lowest at night. This creatinuria has been observed in four cases of fractured femurs (all that were studied); in some fractures of the tibia and fibula; in a case of fracture of the pelvis, and in a less degree in several, though not all, cases of fracture of the tibia alone. Administration of thyroid gland increased the output of creatine threefold in a case of fracture of the femur. The hourly rate of excretion was increased during each of the four periods into which the twenty-four were divided; this increase was most marked at night, when without thyroid the output was smallest; at other times of the day it was such that the maximum output was shifted from the morning to the evening so as to coincide with the maximum nitrogen output. The increase in the output of creatine preceded any change in the basal metabolism or in the other nitrogenous constituents of the urine. Creatinine was not increased and the uric acid showed only a slight rise. A diuresis was observed in each case as a result of taking thyroid; it was most marked and sustained in the case of fracture of the femur, in which the creatinuria was also increased by taking the drug.

Annales de l'Institut Pasteur, Paris

42: 1149-1281 (Oct.) 1928

*Transplacental Infection by Tuberculous Ultravirus. A. Calmette, J. Valtis and M. Lacomme.—p. 1149.
*Bacteriology and Serotherapy of Acute Appendicitis. M. Weinberg, A. R. Prévot, J. Davesne and C. Renard.—p. 1167.
Pathogenesis of Cholera. P. Zdrodowski.—p. 1242.
Intracerebral Tumor Transplants. E. Harde.—p. 1259.

Transplacental Infection by Ultravirus of Tuberculosis.—From the study of twenty-six fetuses and infants born of tuberculous mothers but having no contact with them after birth, Calmette et al. conclude that although one cannot deny that tuberculosis may be transmitted by the direct passage of normal forms of the tubercle bacillus through the healthy or the injured placenta, one must consider this form of transmission as relatively infrequent since it could be demonstrated in only three out of the twenty-six fetuses and infants examined. On the other hand, transplacental infection by the ultravirus of tuberculosis occurs much more frequently; this form of infection appears to occur with great intensity during the third, fourth, fifth and sixth months of pregnancy in women with progressive tuberculosis, particularly pulmonary or meningeal. During this period, transplacental infection is very severe and generally results in the death of the fetus or of the infant in the first few weeks after birth. However, since the mortality at birth and during the first two months after birth of the infants of tuberculous mothers does not seem to exceed 20 per cent and since the number of infants of tuberculous mothers, who are born infected with the ultravirus, is doubtless much greater (perhaps 80 per cent, inasmuch as its presence was demonstrated in twenty out of the twenty-six fetuses and infants examined), one must conclude that approximately 60 per cent of new-born infants who are carriers of ultravirus support this infection without immediate injury. It is even possible that the ultravirus partially immunizes some of them and renders them less sensitive to virulent reinfections. Certain experimental facts observed by the authors are in favor of this hypothesis and, in any case, an extensive experience demonstrates that these infants support very well, and with evident advantage, preventive vaccination with B.C.G. It is possible that the ultravirus of tuberculosis may even become a useful agent in the treatment of tuberculosis.

Bacteriology and Serotherapy of Acute Appendicitis.—In the study of the bacterial flora of the appendix in 225 cases of acute appendicitis, Weinberg et al. found that: Contrary to the opinions of several investigators, acute appendicitis without bacteria in the lumen of the appendix is altogether exceptional. Acute appendicitis is rarely caused by a single species of bacteria; in the majority of cases the bacterial flora comprises two or three species, but it may comprise as many as seven. The monomicrobial cases were all caused by aerobic bacteria. Gangrenous appendicitis is caused most frequently by the interaction of different kinds of bacteria. Although these associations almost always comprise one of several species of anaerobes, gangrenous appendicitis in which the bacterial flora consists entirely of aerobes does occur. Highly pathogenic species of anaerobes are frequently found in acute, nongangrenous appendicitis. The intervention of pathogenic species of anaerobes always modifies the course of this

infection and makes the prognosis worse. Spirilla and spirochetes are rarely found in the pus of appendicitis. In appendicitis the association of *Bacillus coli* and *Bacillus perfringens* occurs with especial frequency; these two kinds of bacteria play the most important rôles in its pathogenesis. The slightly pathogenic bacteria frequently become important by increasing the virulence of the bacteria with which they are associated. Weinberg studied the effect of antigangrene serum on the postoperative course of forty-four cases of gangrenous appendicitis and fifty-two cases of severe, acute, nongangrenous appendicitis. He believes that in appendicitis the surgeon should first remove the focus of infection and then combat the intoxication by the injection of a polyvalent serum. The beneficial action of antigangrene serum in the treatment of appendicitis is enhanced if one replaces the *Clostridium oedematiens* serum in it by *Bacillus coli* serum. In the very severe cases of appendicitis in which operation is performed at once, from 60 to 80 cc. of serum should be injected after the operation and while the patient is still under the influence of the anesthetic. In all the other cases the serum should not be injected unless the surgeon finds severe lesions of appendicitis or periappendicitis which the clinical examination did not reveal. In cases of peritoneal lesions the author recommends that a part of the serum be injected into the abdominal cavity before the peritoneum is sutured. The serum may also be used in cases of appendicitis in which the surgeon considers it inadvisable to operate at once.

Lyon Chirurgical, Lyons

25: 513-647 (Sept.-Oct.) 1928

*Osteitis Following Use of Lane Plates. E. Dahl-Iversen.—p. 513.
*Treatment of Gastric Ulcer. M. Goullioud.—p. 526.
*Treatment of Mal Perforant. A. Contargyris.—p. 548.

Frequency and Duration of Osteitis Following Use of Lane Plates in Fractures.—In a study of 274 cases of fracture in which osteosynthetic operations were performed, Dahl-Iversen found that in 35 per cent of the cases in which Lane plates were used osteitis developed and in 7 per cent of these cases pseudarthrosis resulted. After the plates were removed, the osteitis healed in the first four months in 53 per cent of the cases, in the first year in 80 per cent, and in from one to three years in 20 per cent. In about 75 per cent of the cases the complications greatly impaired the final functional result. Complications developed in 50 per cent of the cases of compound fracture and in 28 per cent of the cases of simple fracture. The most favorable time for performing an osteosynthesis is about one week after the fracture is sustained. The metal plate frequently retards consolidation. A plate that is tolerated for six months will be tolerated indefinitely. Osteosynthesis gives an ideal functional result in the cases of uncomplicated fracture, and normal mobility in the neighboring articulations in 85 per cent of irreducible diaphysis fractures.

Treatment of Gastric Ulcers by Pylorectomy and Pyloric Hemigastrectomy.—For almost twenty-five years Goullioud has reserved gastro-enterostomy for gastric ulcer patients who are very thin or very weak and for those in whom the lesion appears to be exclusively cicatricial. He performs pylorectomy in patients with more resistance as soon as he feels an induration, provided it is sufficiently limited or mobile, if other symptoms justify a presumptive or definite diagnosis of ulcer. He believes that resection of the lesion protects the patients better from perforation, hemorrhage and recurrence and that it is particularly effective in curing cases of ulcerocancer. Extensive pylorectomy likewise diminishes the chances of peptic ulcer. The elimination of the pylorus in pyloric hemigastrectomy is of value in the emptying of the newly formed stomach; it renders recurrence impossible. The patient is cured of his hyperchlorhydria and his gastric ulcer.

Treatment of Perforating Ulcer of the Foot by Periarterial Sympathectomy.—Contargyris reports five cases of perforating ulcer of the foot which be cured permanently by periarterial sympathectomy. He prefers to operate on the retromalleolar portion of the posterior tibial artery rather than on the femoral artery and calls attention to the postoperative recurrence of the ulcer in three out of five cases and its permanent healing from one to one and one-half months after this recurrence. No explanation is given for this phenomenon, which constitutes an important clinical fact, since permanent healing of the perforating ulcer of the foot is frequently not obtained until after this postoperative recurrence.

Paris Médical

2: 317-340 (Oct. 20) 1928

Urology in 1928. R. Dossot.—p. 317.
Pathogenesis of Hydronephrosis. B. Fey.—p. 323.
Clinical Varieties of Renal Tuberculosis. E. Papin.—p. 328.
*Elimination of Phenolsulphonphthalein. H. Blanc.—p. 331.
*Hypogastric Cystostomy in Urethral Stricture. P. Flandrin.—p. 335.

Laws Pertaining to Elimination of Phenolsulphonphthalein.—Blanc gives the following laws concerning the elimination of phenolsulphonphthalein: 1. The amount of phenolsulphonphthalein in the divided or total urine is of great value, irrespective of the quantity of urine excreted during the entire length of the test. 2. The amount of phenolsulphonphthalein eliminated represents exactly the functional value of the renal parenchyma but not the functional value of the remaining tubular apparatus. It is the expression of a physiologic rather than an anatomic value. 3. For healthy kidneys the phenolsulphonphthalein content of the total or divided urine remains about the same, regardless of the time at which the urine is collected. 4. For a healthy kidney or for a diseased kidney without lesions of the parenchyma, the amount of phenolsulphonphthalein excreted remains constant as long as the functional value remains constant. 5. When the functional activity of one kidney is decreased there is a compensatory increase in the functional activity of the other kidney. 6. In each discharge of urine there is usually a parallelism between the excretion of urea and the excretion of phenolsulphonphthalein, although the value of this parallelism cannot be determined by a formula or a ratio. 7. Each time that the renal parenchyma is attacked (inflammation, functional disturbances caused by compression of the ureters, circulatory disturbances), no matter how slightly, the elimination of the phenolsulphonphthalein is affected.

Temporary Hypogastric Cystostomy in Treatment of Complicated Strictures of Urethra.—Flandrin recommends temporary hypogastric cystostomy in the treatment of: (1) almost impassable strictures of the urethra, which are accompanied by distention of the bladder with or without infection; (2) multiple and narrow strictures with marked urethritis and balanitis; (3) narrow and unyielding strictures complicated either by subacute, localized periurethritis or by chronic periurethritis with or without fistula formation. He does not consider it indicated in cases of old, narrow, recurrent, impassible strictures frequently involving long portions of the urethra and accompanied by diffuse periurethral sclerosis and multiple fistulas; the function of the urethra is permanently destroyed and external urethrotomy is indicated. Temporary cystostomy is a harmless operation and one that is easy to perform; it is accompanied by fewer risks than are the useless or impossible urethral manipulations, which may upset a precarious "equilibrium" and stir up a latent infection that may become very severe and even endanger the patient's life.

Presse Médicale, Paris

36: 1297-1312 (Oct. 13) 1928

Basal Metabolism in Exophthalmic Goiter. M. Labbé.—p. 1297.
Desensitizing Action of Bacillary Emulsions in Chronic Diseases. G. Boissel.—p. 1298.
*Cancer of Cardiac Region of Stomach. R. Mareschal.—p. 1300.

Clinical and Roentgenologic Aspects of Cancer of the Cardiac Region of the Stomach But Not of the Cardia.—Mareschal reports three cases of cancer involving the cardiac region of the stomach but not the cardia itself, in which dysphagia was absent and in which the roentgen examination, likewise, gave results at variance with those recently described by another clinician.

Riforma Medica, Naples

44: 811-841 (June 25) 1928. Partial Index

*Banti's Hemolytic Splenomegalia and Its Clinical Resemblance to Primary Hemolytic Icterus. E. Greppi.—p. 813.
*Isolation of Streptococcus Viridans in Three Cases of Endocarditis Lenta. M. Mazzeo.—p. 816.
Pancreatitis. A. Tarsitano.—p. 823.

Clinical Resemblance of Banti's Hemolytic Splenomegalia to Primary Hemolytic Icterus.—Greppi brings out that Banti's hemolytic splenomegalia may be defined and characterized by the normal behavior of the resistance of the blood cells; this property, together with the lack of any other blood anomaly and with the sporadic appearance of the disease, constitutes the differential diagnostic factor, as compared with the syndrome (almost always hereditary or familial) of true primary hemolytic icterus, in which, with the pathologic hemolysis, are associated signs of constitutional anomaly in the erythrocytes (abnormal resistance, microcytosis).

Streptococcus Viridans in Endocarditis Lenta.—Within two years Mazzeo isolated *Streptococcus viridans* by blood culture in three cases of endocarditis lenta. On the basis of his observations, he formulates these conclusions: In endocarditis lenta the organism most frequently cultivated from the blood is *Streptococcus viridans.* One must not be content with a single blood culture if that proves negative; it is necessary to investigate the nature of the treatment the patient has received (salicylic acid, methenamine) and adopt some refinement of technic.

Archiv für Gynäkologie, Berlin

134: 439-704 (Aug. 28) 1928

Rôle of Sacro-Iliac Joint in Origin of Static Backache. H. Albrecht.—p. 439.
Cystic Mole, Syncytioma Malignum and Luteum Cysts. S. Joseph and E. Rabau.—p. 461.
Chorio-Angioma. K. Mayer.—p. 482.
Primary Mucous-Forming Adenocarcinoma of Tube. G. Haselhorst.—p. 489.
Melanotic Pigment Formation in Ovarian Cystoma. A. Liepelt.—p. 496.
*Cyclic Changes in Vaginal Epithelium. K. Adler.—p. 504.
Residual Nitrogen Fraction of Vaginal Secretion in Leukorrhea. E. Raab.—p. 519.
Internal Adenomyositis with Copious Hemorrhage in Third Stage of Labor and Puerperium. A. Szenes.—p. 546.
*Actinomycosis of Female Genital Organs Following Abortion. G. Haselhorst.—p. 561.
*Kraurosis Vulvae. E. Terruhn.—p. 578.
Ovarian Function and Cholesterol Metabolism. C. Kaufmann and O. Mühlbock.—p. 603.
Physiology and Pharmacology of Umbilical Cord Circulation. H. Runge, M. Baur and H. Hartmann.—p. 626.
Removal of Peripheral Adventitia in Treatment of Gynecologic Inflammations. I. Vögel and N. Eberlin.—p. 643.
Relative or Absolute Leukocyte Counts? H. Schäfer.—p. 650.
*Bone Formation in Fallopian Tube. O. Reichelt.—p. 666.
*Congenital Skin Defects. F. Heinrichsbauer.—p. 673.
Rôle of Ovarian Hormone in Production of Changes in Pituitary in Pregnancy. H. Baniecki.—p. 693.

Cyclic Changes in Vaginal Epithelium.—Adler was able to confirm Dierks' observations on the cyclic changes in the epithelium of the vagina during the period of sexual maturity. These changes are dependent on ovarian function. In the first half of the intermenstruum the epithelium proliferates and the zone of flattened cells widens and cornifies. Above the intraepithelial zone of cornification a peculiar layer forms, which is apparently a product of differentiation of the epithelium of the uppermost cornified zone. This layer is most highly developed in the premenstrual; it is not found shortly after menstruation but reforms during the intermenstruum. These changes were not affected by extirpation of the uterus; they thus provide a criterion for the function of the ovaries after hysterectomy. In pregnancy this layer (called the "functionalis") is particularly highly developed. During labor it is likely to be injured or removed by mechanical factors. In the puerperium and during lactation amenorrhea, also in childhood and the menopause, it is not found.

Actinomycosis of the Female Genital Organs Following Abortion.—A case of actinomycosis of the genital organs and pelvis following instrumental criminal abortion is reported by Haselhorst. The patient lived for about ten months. The case was at first supposed to be puerperal parametritis, but puncture through the vagina finally yielded pus containing actinomyces. At necropsy the entire presacral and retrosacral connective tissue and the connective tissue of the lateral pelvic wall were involved. The process proceeded downward through the foramina ischiadica and around the left hip joint, without involving the joint itself. The main focus was under the joint in the region of the adductors. The intervertebral disks between the third and fourth and the fourth and fifth sacral vertebrae were diseased and the process had extended to the os sacrum. Metastatic abscesses were found in the body of the fifth lumbar vertebra and in the symphysis pubis. The intestine appeared to be free. No macroscopic foci were detected in the peritoneum, but a few mycelia were found in adhesions between the peritoneum of the bladder and the promontorium and sigmoid. Typical actinomycotic granules were found in the left parametrium, but in the pus that filled the tubes and on their serous coat only mycelia were discovered. The musculature and mucous membrane of the uterus, the wall of the tubes and the ovaries were free; muscle, in fact, was never involved or even inflamed. A very small fistula was discovered leading through the left parametrium and uterine wall into the uterine mucosa not far from the internal os. In the pus that filled the lumen of this passage a very few actinomycotic threads were detected. In the immediate neighborhood of this passage there was no trace of actinomycosis. The author believes that, during the instrumental abortion, perforation of the uterus at this point took place and that then or later the actinomycotic infection was contracted. The article is well illustrated.

Kraurosis Vulvae.—Kraurosis does not, Terruhn affirms, exist without leukoderma, but leukopathia vulvae may exist without kraurosis. These two conditions are not merely different stages of the same disease process, nor is it true that kraurosis sooner or later develops on the soil of every leukopathia vulvae. Leukopathia is an epithelial disease, kraurosis, on the other hand, is predominantly a dermal disease. But it is not correct to speak of simple kraurosis and kraurosis combined with leukoderma, for a dermal disease always exerts a pathologic influence on the epidermis and in every typical kraurosis leukopathic skin changes, i. e., depigmentation, are found. A kraurosis without leukoderma is only an atrophy of the vulva. From the histopathologic standpoint he divides the disease into three stages: the hypertrophic stage, characterized by sclerema, leading to pressure atrophy in the papillary body; the regressive stage with retrogression of the edema and regeneration by granulation tissue in the atrophic cutis layer, and the atrophic stage with scar tissue. Three illustrative cases are given.

Bone Formation in Fallopian Tube.—Reichelt reports two necropsy observations in which bone tissue was found in the fallopian tube. In both cases there were bony trabeculae surrounding medullary cavities and having the appearance of true bone. Photomicrographs are reproduced.

Congenital Skin Defects.—A woman who had a history of two severe attacks of a skin disease with vesicular eruption gave birth spontaneously to a child who presented extensive skin defects on the right leg, both feet and both hands. After birth a number of large vesicles appeared on the gluteal region, the left arm and the chest. Fluid obtained by puncture of one of the vesicles was sterile. At first the child appeared healthy, but it died suddenly three days after birth with cyanosis and respiratory difficulty. Signs of syphilis were not found at necropsy. Grasped with forceps or even with the fingers, the skin came away in fragments, even immediately after death. Thirteen months later the same woman bore a second child, who presented similar skin lesions in almost the same localizations. This child also died suddenly after three days. Thirteen months after this the woman bore a third child. In this child the skin was entirely healthy. One year later it was ascertained that no skin lesions had developed. Histologic examination in the first two cases showed that, while the epidermis was absent at the site of the defects, the other constituents of the skin, corium, appendages, elastic fibers and subcutaneous fatty tissue, were present, though not everywhere in normal amount. A marked inflammatory reaction was present in the region of the defects and in some places extended deep into the tissue. The veins were everywhere dilated, whereas the arteries were moderately contracted. The defects were almost certainly congenital and had nothing to do with amniotic anomalies. The author mentions the similarity of the picture in these cases to that of the dystrophic form of hereditary epidermolysis but feels unjustified in assuming identity between this disease and the condition in his case. A number of photomicrographs accompany the article.

Beiträge zur Klinik der Tuberkulose, Berlin

69: 501-596 (July 23) 1928. Partial Index

Allergy and Classification of Pulmonary Tuberculosis. W. Curschmann. —p. 501.
Epituberculous Infiltration. H. Fernbach.—p. 514.
*Effect of Pulmonary Tuberculosis on Regulation of Respiration. F. Pomplun.—p. 529.
*Pulmonary Tuberculosis Complicating Diabetes. H. Curschmann.—p. 540.
Immunization of Guinea-Pigs with "Saponified" Tubercle Bacilli. K. W. Clauberg.—p. 551.
Serum Flocculation in Tuberculosis. J. von Darányi.—p. 558.
Peroral Lipoid Treatment of Pulmonary Tuberculosis. W. Münchbach. —p. 565.
Flora of Sputum in Hemoptysic Aspiration Pneumonia. A. Finkel-Karpovsky.—p. 594.

Effect of Pulmonary Tuberculosis on Regulation of Respiration.—In severe or moderately severe pulmonary tuberculosis, deficiency of oxygen and an excess of carbon dioxide are both present in the arterial blood. Because of the loss of functioning lung tissue, the oxygen deficiency does not lead to increased washing out of carbon dioxide from the blood, as occurs at high altitudes, and the c_H is deflected to the acid side. The respiratory center is doubly stimulated and each factor in the stimulation increases the activity of the other. There are possibilities of compensation in the excretion by the kidneys of ammonia, in exchange of ions between the blood and the tissues, in the buffer substances of the blood, and in the increased amount of blood in the tissues that results from the widening of the vessels caused by the increase in the c_H.

Pulmonary Tuberculosis Complicating Diabetes.—The tendency to the contraction of tuberculosis exists in light as well as in severe cases of diabetes but is most in evidence in cases tending to acidosis. The tuberculosis is likely to be atypical, but Curschmann's experience has not borne out the prevalent idea that bacilli are seldom demonstrable in the sputum. The physical signs are frequently not pronounced and for this reason the roentgen examination is of special importance. In Curschmann's opinion, every diabetic patient should have a thorough roentgen examination of the lungs. The blood sedimentation reaction is not of diagnostic or prognostic value in diabetic patients with tuberculosis. Night sweats are absent in some cases, present in others. Today diabetic patients with tuberculosis have almost as good chances of recovery as persons with normal metabolism. The author has, however, never seen a progressing tuberculosis have a favorable influence on diabetes. He believes that the diabetic patient who has been under insulin and dietetic treatment for a sufficient length of time is able to stand any reasonable treatment for tuberculosis, carefully administered, including pneumothorax in selected cases. But caution must always be used. Climatic therapy is especially recommended.

Deutsche medizinische Wochenschrift, Berlin

54: 1619-1658 (Sept. 28) 1928. Partial Index

*Pathologic Labors In and Outside the Clinic. L. Fraenkel.—p. 1619.
Fifty Years of Cystoscopy. O. Ringleb.—p. 1621.
Interfereometry and Internal Secretion. A. Zimmer, E. Lendel and W. Fehlow.—p. 1624.
*Roentgen Irradiation in Prostatic Hypertrophy. J. Fürstenau.—p. 1624.
*Malaria Treatment of Metasyphilitic Diseases of Central Nervous System. W. Kaldewey.—p. 1626.
Difficulties in Investigations in Heredity. A. Czellitzer.—p. 1629.
Action of Small Doses: Arndt-Schulz's Law and Homeopathy. K. Kötschau.—p. 1631. C'cn.
Experience with Gonococcus Living Vaccine. F. Wolff.—p. 1632.
Oral Sepsis of Dental Origin and Radical Surgical Treatment. Walkhoff.—p. 1634.
*Intestinal Influenza? J. K. Friedjung.—p. 1636.
Conservative Treatment of Umbilical Hernia in Infancy. C. Nelken. —p. 1636.
Self-Retaining Vaginal Speculum. M. Schönenberg.—p. 1637.

Pathologic Labors In and Outside the Clinic.—Fraenkel urges that all pathologic labors belong in the clinic.

Roentgen Irradiation in Prostatic Hypertrophy.—Fürstenau treated fifty-nine unselected patients with hypertrophy of the prostate with roentgen irradiation. In fifty-five (93.2 per cent) the symptoms disappeared. Each irradiation series included three fields, which were covered sometimes in two days, sometimes in three. Each field was given 70 per cent of the erythema dose through a filter of 1 mm. of aluminum and 0.5 mm. of zinc; the tube measured 6 by 8 cm., the focal distance was 30 cm. and the duration of the irradiation six minutes. In five cases in which carcinoma was suspected the entire erythema dose was applied to each field for nine minutes. In the cases with less than 50 cc. of residual urine, treatment was completed in twenty-one days, on the average. In cases in which spontaneous urination remained difficult after its reestablishment, a second series of irradiations was given after a month's rest. Patients with chronic retention of urine reacted more slowly than others, but he does not agree that they cannot be influenced. The weakest patients were able to stand the treatment, but in one patient, to whom five series were given, a prostatic abscess later developed and proved fatal. This may have been caused by the rays.

Malaria Treatment of Metasyphilitic Diseases of Central Nervous System.—Kaldewey's material from 1924 to 1927 comprises ninety-four patients treated with malaria and 201 patients not given this treatment. The mortality more or less connected with the treatment was 10.5 per cent for the malaria treated patients and 15.4 per cent for the other patients. He urges that treatment should be given early in paresis. In old cases life may be prolonged, but that is all. In general one can reckon on complete remission in from 30 to 35 per cent of cases, with extensive improvement in another 10 per cent. In tabes he gives malaria treatment only on the expressed desire of the patient. He has the impression, however, that the treatment exerts a considerable influence on the further course of the crises. Of multiple sclerosis much the same may be said as of tabes; it may be possible to check the progress of the inflammatory process. The danger of the treatment resides less in the therapy and the high temperature in themselves than in complications in the form of infectious and trophic processes. These complications present particular dangers for patients with tabes and taboparalysis. On account of diminished pain sensation and conduction and mental dulness, these patients are likely to have mild infections without knowing it. Under the influence of the malaria these processes flare up. Quinine is now unable to reduce the fever and the heart may succumb. The search for infectious foci must be particularly thorough in tabetic patients.

Intestinal Influenza?—Friedjung insists that there is such a thing as intestinal influenza and cites his own case, in which severe pain in the abdomen and diarrhea accompanied and to a certain extent overshadowed the usual symptoms of influenza.

Wiener klinische Wochenschrift, Vienna

41: 1361-1392 (Sept. 27) 1928

*Electrocardiogram in Occlusion of Coronary Artery. W. Dressler.—p. 1361.
Gastrospasm in Organic Nervous Diseases. L. Hess and J. Faltitschek. —p. 1366. C'td.
Dengue. R. Kraus.—p. 1371.
Influence of Gas and Vapor Forming Drugs on Human Organism. K. Rudsit.—p. 1372.
Case of Persistent Ductus Botalli Complicated by Pregnancy. A. von Schulcz.—p. 1374.
Action of Ephedrine. L. Takács.—p. 1375.
Diuretics. A. Herz.—p. 1378.
Manual Separation of Placenta. H. Peters.—p. 1379.
Extract of Jaborandi. F. Mattausch.—p. 1380.
Infectiousness of Cerebrospinal Fluid in Paresis. R. Frühwald.—p. 1381.
Treatment of Acne Rosacea. R. O. Stein.—p. 1382.
In What Bone and Joint Diseases is Roentgen Examination Valuable? F. Eisler.—p. 1385.

Electrocardiograms in Occlusion of Coronary Artery.—A case of occlusion of the coronary artery studied with the electrocardiograph is reported by Dressler. He also reviews the literature on the subject of the electrocardiogram in this condition. He found that the T deflection merged with the R deflection and that for a short time after the occlusion the height of the T deflection was decreased. In the first or second leads, sometimes in a number of leads, the T deflection was negative; this negative T was preceded by an R-T interval with the convexity pointing upward. Usually the T deflection was very deep and sharply pointed.

41: 1393-1420 (Oct. 4) 1928

Structure of Tumor Cells. B. Lipschütz.—p. 1393.
*Hyperexcitability of Labyrinth and Diagnosis of Brain Lesions. H. Brunner.—p. 1396.
*Prophylactic Vaccination Against Tuberculosis with B C G. M. R. Heynsius van den Bergh.—p. 1400.
Histochemical Demonstration of Urea. W. Laves.—p. 1403.

*General Treatment of Skin Diseases. O. Kren.—p. 1404.
*Passive Immunization Against Scarlet Fever. J. Zikowsky.—p. 1408.
*Gastrospasm in Organic Nervous Diseases. L. Hess and J. Faltitschek. —p. 1409. C'en.
Mongolian Spot. J. K. W. Neuberger.—p. 1410.
Indications and Contraindications for Insulin Treatment of Diabetes. W. Falta.—p. 1411.
Diagnostic Value of Headache in Diseases of Ear. C. Stein.—p. 1412.

Hyperexcitability of the Labyrinth and Diagnosis of Brain Lesions.—In diseases with increased brain pressure there is frequently hyperexcitability of the labyrinth. This hyperexcitability, Brunner says, may occur with tumors of the cerebrum as well as with those of the cerebellum, though it is more frequently found associated with tumors of the cerebellum for the reason that increased brain pressure occurs more often with these tumors. It may be bilateral or unilateral. When it is bilateral, it can best be demonstrated by the caloric test; with the rotation test its demonstration is much more difficult. When it is unilateral, it may be demonstrated by bilateral calorization if the tumor is in the cerebellum, but not if it is in the cerebrum.

Prophylactic Vaccination Against Tuberculosis with B C G.—Heynsius van den Bergh presents a critical study of the effects of vaccination with B C G. The number of infants vaccinated according to Calmette's method was ninety. They were kept from the source of infection on the average from ten to twelve days, instead of the month demanded by Calmette. Before exposure the children were examined roentgenologically as well as otherwise and no signs of tuberculosis were found. One child died of congenital syphilis at the age of 2 months, without having been in contact, worth speaking of, with the tuberculous mother. Enlarged mesenteric glands containing tubercle bacilli were found, but on histologic examination no tuberculous changes could be detected in these glands. His experience thus speaks for the harmlessness of the method. For the consideration of the protective value of the vaccination, he reduces his material to twenty cases, observed for at least one and one-half years, and for comparison uses fifty control cases. He divides the children into a number of classes according to the gravity of the danger to which they became exposed and the quality of the general prophylaxis received, and discusses each separately. In the unvaccinated children absence of general prophylactic attention resulted in a striking increase in mortality. One death from tuberculosis took place among the vaccinated children, nine among the control children. On the usual clinical examinations, the remainder of the vaccinated children all appear free from tuberculosis; roentgen examination, however, reveals signs of tuberculosis in the lungs in a few. The disease appears to be benign. He cites a case in which the vaccinated child of a tuberculous woman remained free of the disease, in spite of bad general prophylaxis, while the unvaccinated infant of the patient's sister contracted it from the patient, there being no other tuberculous contacts.

General Treatment of Skin Diseases.—Purgatives may be useful not only in skin diseases of intestinal origin but also, combined with diuretics, in many congestive dermatoses. Recent investigations have shown that in pemphigus there is a retention of sodium chloride; in other exudative diseases, also, reduction of sodium chloride in the diet would seem to be indicated. In diseases in which the tissues are deficient in water, such as scleroderma and keloid, a diet rich in sodium chloride is recommended. In most inflammatory and certain exudative lesions, such as erythrodermia, universal eczema and acne rosacea, alcohol in high concentrations, coffee and tea, especially when taken hot, are bad, in that they drive the blood into the skin. The rôle of the reticulo-endothelial system in intravenous therapy is discussed. Almost everything injected into the vein acts primarily on this system. If the reticulo-endothelial system is injured, as for instance by a septic process, medicines introduced by intravenous injections have more difficulty in acting and may even do harm. Kren recommends physiologic solution of sodium chloride by rectal drip in septic processes, combined with intravenous injections of acriflavine. He has found it successful in treatment of acute lupus erythematodes. Treatment of skin diseases with endocrine glands is often disappointing. The cause may be that it is frequently broken off too early. Protein or activation therapy gives better results. Its action seems to be twofold—production of hyperleukocytosis and a local action on the disease focus itself. It is most successful in subacute diseases in which there is a good circulation. These react by increased inflammation, on which healing follows. Allergic diseases may be treated by protein or colloid therapy to produce nonspecific desensitization if the sensitizing agents are unknown. Venesection brings about a certain change in the capacity of the organism to react and thus is sometimes useful in skin diseases, especially those associated with menstrual disturbances. Local remedies that have before been useless may succeed after venesection. In severe burns, blood transfusion repeated daily or twice a day sometimes proves life-saving; one or two transfusions are usually of little benefit. Finally, activation therapy may be combined with vaccine treatment or with organotherapy, and either one with venesection, medical or dietetic treatment. The physician's endeavors are no longer confined to the local lesion but include also the health of the entire man.

Passive Immunization Against Scarlet Fever.—Zikowsky reports good results in immunization of adults and children by injection of 10 cc. of scarlet fever therapeutic serum according to the method of Moser and Dick. It did not succeed in every case, however, so that he thinks the dose of 10 cc. is too small.

Gastrospasm in Organic Nervous Diseases.—A case of total spasm of the stomach lasting for half an hour, with absence of peristalsis and closure of the pylorus, is reported by Hess and Faltitschek. The spasm was not accompanied by pain, tension of the abdominal muscles or local hyperalgesia. The patient was a man with a brain tumor situated in the right frontal lobe. No pathologic changes were found at necropsy in the stomach, duodenum or other organs. A similar case of gastrospasm occurred in a patient with parkinsonism following encephalitis and in a patient with multiple sclerosis. These spasms are, the authors believe, of central origin. They are determined by lack of harmony between the tonic and kinetic impulses with simultaneous hypertonia of all the muscle layers. In human pathology such a situation is known only in cases in which a lesion of a basal ganglion releases the cerebral muscle tonus and at the same time disturbs the antagonistic regulation. The regulation of the tonus and the innervation of the internal organs are discussed and the literature on gastrospasm is reviewed.

Zentralblatt für Gynäkologie, Leipzig

52: 2329-2432 (Sept. 15) 1928

Vaginal Radical Operation of Carcinoma of Cervix. T. Heynemann.—p. 2330.
Extensive Development of Sebaceous Glands in Vagina and Portio. H. Hinselmann.—p. 2332.
Beuttner's Wedge Shaped Resection of Fundus of Uterus. H. Köhler. —p. 2335.
*Puerperal Pulmonary Gangrene. P. Deseniss.—p. 2339.
*Menstruating Endometrium in Abdominal Wound. A. Rieck.—p. 2341.
*Diagnosis of Appendicitis in Women. H. Grube.—p. 2344.
*Thrombosis and Embolism: Causes and Prevention. A. Calmann.—p. 2346.
Mortality in Pregnancy, Labor and Puerperium. H. Nevermann.—p. 2351.
*Fibrous Degeneration of Endometrium and Deposition of Calcium in Uterine Cavity. O. Wolfring.—p. 2357.
When Should the Child First be Put to the Breast? Willkomm.—p. 2359.
Cesarean Section with Dead Child. A. Blombach.—p. 2362.
Pyelo-Ureterogram and Ureteral Catheterization in Pyelitis of Pregnancy. F. Sennewald.—p. 2364.
Changes in Mucous Membrane at Tubal Angle. R. Cordua.—p. 2371.
Origin of Ovarian Pregnancy. A. Haeuber.—p. 2376.
*Acute Necrosis of Pancreas and Pregnancy. H. Märtens.—p. 2381.
*Question of Menstrual Cycle in Human Vaginal Mucous Membrane. Stemshorn.—p. 2387.
Cause of Spontaneous Rupture of Umbilical Cord. G. Haselhorst.—p. 2392.
Roentgen Examination of Pelvis as Obstetric Aid. H. Kienlin.—p. 2397.
Metabolic Exchange Between Placenta and Maternal Blood. S. Jebsen. —p. 2406.
*Color of Urine in Relation to Hepatic Function in Pregnancy. O. Heesch. —p. 2411.
*Prognosis of and Indications for Interruption of Pregnancy for Hyperemesis Gravidarum. T. Heynemann.—p. 2417.

Puerperal Pulmonary Gangrene.—Deseniss calls attention to the possibility of successful surgical intervention (rib resection and pneumotomy) in certain cases of gangrene of the lungs occurring in thrombophlebitic puerperal fever, and cites two cases twenty years apart.

Menstruating Endometrium in Abdominal Wound.—Fourteen years after an extraperitoneal cesarean section accord-

ing to Latzko, Rieck's patient returned on account of a skin tumor in the scar of the incision. This tumor bled slightly almost always, but at the menstrual periods the bleeding was profuse. Rieck excised the tumor and sought for a sinus leading to the uterus, but none existed. Microscopic examination showed that the tumor was a connective tissue structure, containing glands. Cornified squamous epithelium took the place of the columnar epithelium of the uterus. The subcutaneous fat was absent. The bleeding outside the menstrual periods is accounted for by rupture of blood-filled glands near the surface; during menstruation there was, apparently, in addition, a bleeding from the entire surface, probably not only by diapedesis, but also from shedding of the outer layer of epithelium.

Diagnosis of Appendicitis in Women.—Grube has found that many women, especially nervous women, react with expressions of pain to anything that appears to threaten the uterus. In these women pressure on McBurney's point seems to elicit pain. If now, however, the uterus and adnexa are palpated bimanually and then the hand outside the vagina is used to palpate McBurney's point, the latter is no longer found to be sensitive (if appendicitis does not exist), for the reason that the impression caused by the bimanual palpation of the uterus itself has overshadowed that caused by palpation of the distant point.

Thrombosis and Embolism: Causes and Prevention.—Calmann cites cases that point to an hereditary predisposition to thrombosis and others that suggest a connection with the employment of the laminaria tent. In his experience thrombosis has occurred almost exclusively after abdominal operations. In 180 vaginal operations according to Schauta for cancer, he had only one case of thrombosis. He has now abandoned the use of vessel clamps in all operations, except in emergency conditions. In his last 131 operations (seventy-two abdominal, fifty-nine vaginal) he had two cases of thrombosis with no deaths from this cause. In 131 operations (eighty abdominal, fifty-one vaginal) from the preceding months, when he still used clamps, there were nine cases of thrombosis and two deaths from pulmonary embolism. In treating thrombophlebitis of the lower extremity he views with favor Heinrich Fischer's method with adhesive strapping, drawn very tightly. To prevent the breaking off of the thrombus during the application of the bandage, a fold is made in the skin over the vein, central to the thrombus. In this fold a tampon is laid and the skin is drawn up over it and held in place by a strip of adhesive plaster. The patients are encouraged to walk immediately. However, among twelve cases thus treated, he had one with a number of severe pulmonary infarcts. The immediate getting about on the feet, which Fischer held to be an essential part of the treatment, is of course not always possible in postoperative cases.

Fibrous Degeneration of Endometrium and Deposition of Calcium in Uterine Cavity.—An unmarried woman, aged 30, consulted Wolfring for stubborn constipation and for lifelong amenorrhea except for two periods at the age of 17. Curettage brought forth calcium concretions instead of mucous membrane. On laparotomy the adnexa on both sides were found chronically inflamed and the tubes were partially calcified. The intestinal loops were extensively bound together by adhesions. Wolfring removed the uterus. The mucous lining was transformed into fibrous tissue with extensive areas of calcification, and the cavity was entirely filled with calcium concretions. No signs of tuberculosis were seen.

Acute Necrosis of the Pancreas and Pregnancy.—From a review of the literature and a case observed by him, Märtens comes to the conclusion that a direct causal connection between pregnancy and necrosis of the pancreas does not exist. In most of the cases in the literature and in his case disease of the efferent bile ducts was also present. Pregnancy, he considers, may predispose to pancreatic nephrosis by disturbing the cholesterol metabolism and leading thus to cholelithiasis.

Question of Menstrual Cycle in Human Vaginal Mucous Membrane.—Examination of specimens of mucous membrane removed from the vagina in thirty-two women has convinced Stemshorn that periodic changes, paralleling those of the uterine mucous membrane, do not take place in the human vagina. The blood supply of the vaginal mucous membrane undergoes variations during the menstrual cycle. In the premenstruum and during menstruation capillaries are present in the greatest abundance and all the vessels are gorged with blood. In the postmenstrual period the blood supply is much reduced.

Color of Urine in Relation to Hepatic Function in Pregnancy.—In severe cases of hyperemesis and in all cases of icterus in pregnancy, of eclampsia, eclampsism, pregnancy nephrosis and circulatory disturbances in pregnancy in which Heesch examined the urine with the "Stufenphotometer," increased color values were found. In general, the increase corresponded to the severity of the case. He believes that examination of the urine for color intensity is as important for the detection of disease of the liver as are the usual urine examinations for detection of disease of the kidney.

Indications for Interruption of Pregnancy for Hyperemesis Gravidarum.—Symptoms pointing directly to acute yellow atrophy and to toxic degeneration of the liver (cerebral disturbances, neuritis, particularly optic neuritis, and temperature of 39 C.) in causal connection with grave vomiting demand immediate evacuation of the uterus. An increase of bilirubin in the blood and the presence of albumin and cylinders in the urine are indications that the former symptoms are consequences of the hyperemesis and not of intercurrent disturbances. Heynemann has never seen a really bad case without high blood bilirubin values.

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*Etiology of Angina Pectoris: Treatment. J. S. Shwarzman.—p. 1233.
*Basal Metabolism in Heart Diseases. N. S. Troizkiy and A. L. Vilkovyskiy.—p. 1237.
Toxic Cardiopathy in Anesthetist as Result of Chloroform. M. B. Seldes.—p. 1242.
Osmotic Stability of Erythrocytes. F. S. Seliverstov.—p. 1245.
Syphilis of Heart with Extrasystole, Bigeminy and Bradysphygmia. G. I. Katz.—p. 1249.
Rheumatic Infection. A. A. Kissel.—p. 1253.

Etiology of Angina Pectoris and Its Treatment.—Epinephrine injection, inhalation of amyl nitrite, hot baths and contracture of muscles lessen the tendency of the heart muscle to become spastic, Schwarzman states. He bases his observations on the results of auscultation of the heart while the patient strains the musculature of the arms, or any other isolated group of muscles. There was suppression of the heart sounds in cases of hypotonia of the heart muscle. Except in the angina caused by thrombosis of the veins, there are data to justify the supposition of spasm of the coronary arteries and even spasm of the heart muscle itself as being etiologic factors in angina pectoris. The use of epinephrine is advised in all spastic conditions of the heart muscle, including angina pectoris nervosa. Most of the patients observed were women from 30 to 40 years of age; their chief complaint was a sense of contraction in the region of the heart. Epinephrine in doses of from 0.5 to 0.75 mg. subcutaneously relieved them for two or three days. There were cases in which from five to six injections every other day remained effective for from six to eight weeks. The attack might be caused by the general effect of cold or by putting the hands in cold water, the left hand particularly. A few vigorous movements with the arms or bending the knees had the same effect as epinephrine: Tension of the musculature prevents spasm of the heart muscle for a short time. The author points out that the attack which is brought on at the beginning of physical exertion very often passes after several movements. This factor gives rise to the supposition that the musculature produces a muscle hormone, which, when it enters the blood, prevents the spasm of the heart muscle. Therefore the question is whether the skeletal musculature is primarily diseased in angina pectoris.

Basal Metabolism in Heart Diseases.—Troizkiy and Vilkovyskiy tested the basal metabolism of forty-four patients with heart diseases. Four patients had a neurosis; twenty-eight, diseases of the valves; ten, myopathy; one, endocarditis lenta, and one, pericarditis. In the majority of cases the basal metabolism was increased in the stage of compensation. The intensity paralleled the degree of acidosis of the blood. The basal metabolism test is valuable for the solution of the problem of the pathogenesis of heart insufficiency.

Pediatria, Moscow

12: 195-293, 1928

Purulent Blocked Meningitis in Infants. A. M. Lesht.—p. 195.
*Sugar and Ketone Bodies in Cerebrospinal Fluid and Blood in Meningitis and Diseases of Central Nervous System: Diagnostic Value. E. A. Gornitskaya.—p. 204.
*Schilling's Leukocyte Picture in Scarlet Fever. M. S. Silberstein.—p. 227.
*Comparative Evaluation of Sondern's and Schilling's Methods of Blood Analysis in Scarlet Fever. A. F. Petrova.—p. 240.
Catalysis of Blood in Various Children's Diseases. K. P. Sarylova.—p. 248.
Percentage of Hemoglobin in Blood of Tuberculous School Children. N. M. Kaiser.—p. 259.
Diabetes in Children: Treatment. E. M. Kaplan.—p. 272.

Sugar and Ketone Bodies in Cerebrospinal Fluid and Blood in Meningitis and Diseases of Central Nervous System: Diagnostic Value.—Gornitskaya states that the determination of ketone bodies in the cerebrospinal fluid does not have any diagnostic value. The simultaneous analysis of sugar in the cerebrospinal fluid and in the blood might serve as a helpful indication in the differential diagnosis of meningitis. The quantity of sugar in the cerebrospinal fluid in normal conditions is less than that in the blood, from 20 to 30 mg. per hundred cubic centimeters of fluid. In meningitis the sugar decreases in the cerebrospinal fluid in the beginning of the disease. It varies in different types of the disease: in tuberculous meningitis the decrease reaches 10 mg. per hundred cubic centimeters of fluid; in serous meningitis the sugar increases in amount with the progress of the disease; in cerebrospinal meningitis also the sugar increases. It is increased in meningitis occurring during the course of scarlet fever. It is likewise increased in epidemic encephalitis, in syringomyelia and in chronic cerebral edema. In cases of poliomyelitis, epilepsy and chorea it remains normal. The blood sugar is increased in tuberculous meningitis; in the other types of meningitis it remains normal. In tuberculous meningitis the difference between the blood sugar values and the cerebrospinal fluid sugar values is considerably greater than normal: from 90 to 120 mg. per hundred cubic centimeters of fluid; in serous and cerebrospinal meningitis the difference is slightly more than normal: from 40 to 50 mg.

Schilling's Leukocyte Picture in Scarlet Fever.—Silberstein's observations of hemograms of forty-four children with scarlet fever, in which 400 blood analyses were made, showed: The hemogram in the acute period is characterized by neutrophil leukocytosis and a sharp shifting to the left. Eosinophilia is observed in the acute period in the majority of light forms; in cases of medium gravity it occurs less frequently; in grave cases eosinopenia or a complete absence of eosinophils is found. The eosinophilia usually begins on the second or the third day of the illness and in the majority of the cases it reaches its maximum between the third and the seventh day. A secondary increase of eosinophils is quite often seen in the fourth or fifth week. For the diagnosis of scarlet fever the blood picture is of value in cases in which eosinophilia occurs with the neutrophil leukocytosis and the shifting to the left, as the other two phenomena appear in various diseases. The gravity of the disease is characterized by the amount and, chiefly, by the degree of the nuclear shifting; also by toxic degenerative changes of the neutrophils. In simple cases, the nuclear shifting returns to normal not later than the second week and if there are no complications it remains normal. The severe complications are always accompanied by increase of the shifting. In slight complications the neutrophilia and the leukocytosis alone may be present.

Comparative Evaluation of Sondern's and Schilling's Methods of Blood Analysis in Scarlet Fever.—Sondern suggested that leukocytosis is an indicator of the resistance of the organism to infection. Neutrophilia, on the other hand, is an indicator of an inflammatory process and of toxic absorption. Slight infections with high resistance present slight leukocytosis; severe infections with high resistance are accompanied by a more pronounced leukocytosis; when the resistance is low, the leukocytosis is inconsiderable or there is leukopenia. The neutrophils increase in inflammatory processes, the degree of increase corresponding to the gravity of the inflammatory changes in the organism. Sondern states that the comparison of the curves of leukocytosis and of neutrophilia gives a clear picture of the biologic condition of the patient. The scheme of Sondern's examination consists of two scales placed side by side, one for the leukocytosis and the other for the neutrophilia. The increase of leukocytosis on a scale of 1,000 corresponds to 1 per cent increase of neutrophilia. The line which connects the two points in the same column is called Sondern's line of resistance. Petrova made 224 examinations on twenty-seven patients and reports that scarlet fever presents increased leukocytosis and neutrophilia at the beginning and that in simple cases Sondern's curves return to normal by the seventh or the eighth day. Further, the line of neutrophilia, with few exceptions, is higher than the line of leukocytosis. Seventy-five per cent of the patients treated left the hospital with a normal leukocyte count; the rest left with an increased count. In children one should not pay very much attention to the length of the line of resistance or to its high or low situation on the scale. The main interest is in the relation of the curves of the leukocytosis and the neutrophilia. Fluctuations of the neutrophilia without clinical evidence were observed in 12.3 per cent: on the eleventh day in 0.5 per cent, from the seventeenth to the nineteenth day in 3.2 per cent from the twenty-seventh to the fortieth day in 8.6 per cent. The considerable periodic fluctuations of neutrophils make Sondern's picture less stable in light and medium forms of scarlet fever. In grave cases the curves reflect the condition of the organism better. Of the complications, lymphadenitis showed a very pronounced reaction. Slighter reactions occurred in otitis and in angina. In cases in which the patients are treated with serum, Sondern's reaction has a considerable prognostic value. In comparing Schilling's method with that of Sondern, Petrova thinks that the first one is more stable and permits of determining the degree of the infection and of the injury to the organism earlier. Sondern's method is more labile and does not give sufficiently certain ground for prognosis. An advantage of Sondern's method is its simplicity.

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Grave Hemorrhagic Colitis. W. A. Kuenen.—p. 4627.
Case of Acute Polymyositis. S. van Creveld and P. Ouwehand.—p. 4639.
Obstetrics in Dutch East Indies. N. J. A. F. Boerma.—p. 4650.
*Cancer of Body of Uterus. D. den Hoed.—p. 4654.
*Differences Between Lobar Pneumonia of the Upper and Lower Lobes in Children. A. C. Belmonte.—p. 4662.
*Statistics of Multiple Births. J. Sanders.—p. 4669.
Sugar Treatment of Epilepsy. G. C. van Walsem.—p. 4673.
Abdominal Symptoms in Ectopic Position of Ascending Colon. S. Hylkema.—p. 4676.

Cancer of Body of Uterus.—The material discussed by Hoed consists of twelve cases, only three of which were operable. In these three, operation was followed by irradiation. In one, cure resulted. In nine, irradiation (radium and roentgen rays) was used exclusively. In this group there were five cures (9½, 8, 5½, 3 and 1½ years). The radium was applied within the uterus. The dose was from 2,000 to 4,500 milligram hours of radium filtered through 1.5 mm. of gold. In the treatment of recurrences, smaller doses were used. In none of his cases did fistulas develop.

Differences Between Lobar Pneumonia of the Upper and Lower Lobes in Children.—From a study of sixty-six cases of lobar pneumonia of the upper lobe and sixty-one of the lower lobe in children, made by Belmonte, it appears that the clinical picture differs widely, according to lobe affected. In pneumonia of the lower lobe an acute abdominal disease is simulated. Pain in the abdomen, nausea, vomiting and muscular defense are present and constipation is a constant symptom. Such cases may be mistaken for acute appendicitis. Diarrhea is practically never present, while it is frequent in pneumonia of the upper lobe.

Statistics of Multiple Births.—Sanders studied the statistics of twin births in Holland in the past twenty-five years for an answer to the question whether twins of different sexes have a better chance to be born alive than twins of the same sex. He found that almost half of the twins of the same sex are uniovular and that twins of different sexes are almost without exception biovular. He found further that uniovular twins had less chance to be born alive than biovular twins. Hence it appears that twins of different sexes have a greater chance to be born alive than twins of the same sex.